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ULTRASONICS AND THEIR RELATION TO MEDICINE.[1]

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IT is my intention to deal with the effects of ultrasonic sounds from two points of view—the first, exposure to air-borne sounds, and the second, exposure to sounds conducted by fluids or solids.

Under the heading of air-borne sounds, I should like to outline some of the experimental work in which we have been directly involved. Our project, undertaken on behalf of the Director-General of Medical Services, Royal Australian Air Force, was to investigate the possible biological effects of air-borne ultrasonic sound. It is with the full permission of the Director-General of Medical Services that the following account is given. The problem arose as a result of the many rumours emanating from personnel working near jet engines and exposed to sound fields of high intensity. It was considered possible that sounds above the level of human hearing could be responsible for certain changes. If it could be shown that ill-effects could result from exposure to ultrasonic sounds, it would be necessary to pursue the matter further; if not, then the rumours could be dispelled with finality. If the effects could not be attributed to ultrasonic sounds, then other causes must be sought.

Quite a formidable array of symptoms had been reported —nausea, vomiting, unsteadiness, undue fatigue, bleeding from the lungs, loss of appetite and libido, frontal headaches, low blood pressure and "general collapse". The matter had received widespread publicity in the popular Press, and a bogy known as "supersonic sickness" was reported to be stalking the airfields.

As no jet engines were available to us for human exposure experiments, less powerful sources had to be produced. These consisted of sirens, magnetostrictor bars and crystal transducers. The most suitable biological material was man, and any species of animal with a marked behaviour pattern to sound. Maier in 1939 first described the abnormal behaviour pattern of convulsive activity in the rat and considered it to be of neurotic origin, but Morgan and Morgan (1939) proved it to be due to sound. Jingled keys, resonated buzzers and air jets were sources shown to produce an "audiogenic seizure" in rats. If this finding could be confirmed, then spectral analysis of the key jingles and other "active" sounds could be used to define the most active frequencies and intensities for that species.

The exposure of human volunteers to high levels of ultrasonic sound was planned concurrently.

[1] Read at a meeting of the Oto-laryngological Society of Australia (British Medical Association), Adelaide, August 21 to 24, 1956.

EXPERIMENTAL STUDIES.

The audiogenic seizure was readily confirmed on a trial with a small number of animals. However, the response was not predictable, so a larger group of 85 animals was exposed to key jingling for one and a half minutes daily for a period of four months. The form and daily rate of seizure were studied in detail. The following behaviour patterns might be induced when keys were jingled at a distance of a few inches from the 18 by 12 by 10 inch cage:

1. There might be no effect.

2. The animals would become quiet and slink off into a corner, as far from the keys as possible. The ears would be laid back as if in an attempt to close the opening of the pinna (pinna reflex). A convulsion might follow, but more usually a running episode would occur, in which the animal would run wildly, hurling itself around the cage. Such an episode might last five to ten seconds, and then, as if exhausted, the animal would become very docile, or the episode would terminate in a convulsion and coma similar to that seen in the human epileptiform seizure. In the final episode the teeth were often tetanically locked on the bars of the cage or in the flesh of a companion.

3. Two running episodes might occur, with or without a terminal convulsion.

4. Throughout the whole period of exposure, running episodes might follow one another in succession.

5. Immediately after a convulsion the animals were quite plastic, and the limbs or tail could be placed in bizarre positions which were held for three or four minutes.

6. If the key shaking was continued, as consciousness reappeared, with each volley of noise, the animal would shudder in time with the stroke.

If the animal was freed from the retaining cage and placed on the floor, the progression was a kangaroo-like hop with both back legs working in unison. Even at long distances from the noise source (for example, six to ten feet), the convulsions could still occur once the activity had commenced.

A complicating factor arose early in the work through a report from Patton (1947), suggesting the possibility of a relationship between *otitis media* and the susceptibility of young albino rats to audiogenic seizure. He stated that infection could be acquired without increase in sensitivity, but that no sensitive animals were free of infection. It became necessary then to investigate the incidence and assess the influence of *otitis media* in our animals before proceeding further. Purulent *otitis media* was found to be widespread in the colony. A project was mooted which appeared to involve no more than the comparison of a group of infected animals with an uninfected group. However, despite extensive searching and attempts to cure the infection with penicillin and sulphonamides, no infection-free group could be collected for study. Finally, evidence was presented by other workers (Kenshalo and Kryter, 1949) that convulsive seizures were as prevalent in uninfected animals as in the infected.

A summary of our results over the four months' period was as follows:

1. There appeared to be no correlation between susceptibility to audiogenic seizure and *otitis media* as a prerequisite—that is, no specific mechanical or toxic factor was involved.

2. The animals fell into groups of persistently high or low activity, with periods of increased activity alternating with periods of freedom from attack. The high-activity group maintained a higher and more consistent rate than those classified as the low-activity group.

3. Susceptible females maintained a high seizure rate during pregnancy and did not abort as a result of convulsions. The progeny were normal. Both libido and appetite appeared unaffected.

4. Restraining the animals in a towel, so that the pre-seizure running episode was eliminated, prevented seizures. It would appear that other afferent stimuli besides the auditory elements were required for a seizure to develop fully. (Restraint was shown by Frings and Frings, 1952, to have the same effect in mice.)

5. Infant rats showed convulsive behaviour within three weeks of birth. In several cases the spinal cord was damaged during the initial convulsion, with paralysis of the hind legs. Nevertheless the head, trunk and forelimbs were seen to participate in subsequent tests. Evidently the barrage of muscle afferents from the forelimbs are sufficient to supplement the auditory components.

6. Jingling keys were a more effective stimulus than pure tones from a magnetostrictor bar. However, tape recordings of jingling keys played back at higher levels than the original recording were ineffective. Presumably the frequency response of the recording microphone had filtered the effective portions of the signal or reduced their intensity.

7. Wild rats, both from a very limited local sample tested and from overseas reports (Griffiths, 1944), do not suffer audiogenic seizure, and consequently the question of naturally selected foods and the genetic factor may be of prime importance. Most institutional strains are developed from the original Wistar (Albino) or Norway hooded stock.

8. Intensity of the signal was involved, as no animals ever had convulsions except when the stimulus was very close, although animals which escaped during the running episode would complete the convulsive episode, even at long range, if the signals were continued.

9. In the post-seizure comatose state, limbs and tail could be placed in bizarre positions, which were maintained for many minutes. During recovery to a conscious but depressed state, the renewal of key jingling would provoke shudders of the same periodicity as the jingling keys—a "strychninized" state.

Gould and Morgan (1941) had reported that the upper limit of hearing in the rat was at least 40 kilocycles as tested by a shock-avoiding technique, and that seizure was provoked most easily at 21 kilocycles. We became convinced that we were investigating a phenomenon related to the audible range of this animal.

Frings and Frings (1952) came to the same conclusion in relation to the mouse. The intense reactions of these two species to complex sounds, which seem of moderate intensity to man, occur because such sounds are within their audible range.

Let us pause for a moment to take stock of these animal experiments.

The first important deduction is that the animals under investigation are being tested in their audible range, the significant characteristics of the effective sound being that it is loud, complex, of sudden high intensity and of short duration. Subsequent analysis of the sound stimulus (jingling keys) showed a frequency spectrum extending as high as 150 kilocycles in bursts of complex nature repeated two or three times per second and with the major portion of the signal about 20 to 80 kilocycles.

HUMAN REACTIONS TO SOUND.

Let us turn now to human reactions. There are reports in the literature referring to sound-provoked epileptiform seizures. MacDonald Critchley (1937) has reviewed the literature on the effects of music in producing epileptiform seizures, and has shown that various types of music can precipitate attacks on selected individuals. Reese (1948) reports two cases of musicogenic seizure in the United States.

To digress for a moment, there is another type of afferent barrage which may provoke an epileptiform seizure in man. A flashing light of great intensity, synchronizing with the α rhythm in individuals with derangement of the optical cortex, may precipitate an epileptiform seizure. (A group of our most susceptible animals was exposed to a flashing light over a wide range of repetition rates, but without any sign of response.)

Our own work involved exposing humans to a siren up to 30 kilocycles with intensities of approximately 110 to

130 decibels. However, the audible element of escaping air and mechanical noise was so great that recourse was had to magnetostrictor bars. In a typical experiment, the subject was exposed to 28 kilocycles for three-quarters of an hour from a magnetostrictor bar held half an inch from the external auditory orifice. The sound level was approximately 120 to 130 decibels, and the sound produced no effect either at the time of exposure or subsequently. To illustrate how little disturbance was experienced, ordinary conversation could be carried on at 10 feet without the subject or the examiner raising his voice; that is, there was no masking, loudness adaptation or post-stimulatory fatigue. Further experiments involving two frequencies given simultaneously also produced no effects.

Two reports have been published by British workers (Edwards, 1950; Dickson and Chadwick, 1950) on jet or siren experimental exposure. In both, emphasis is laid on the fact that intensity and not frequency is the important factor—both sources contain some ultrasonic components. Unpleasant sensations are reported and are most pronounced during rapidly alternating engine speeds, but less so when the engines are run at constant speed.

American workers (Davis, Parrach and Eldridge, 1949) state that high intensity audible sound is potentially hazardous, and that ultrasonic sounds have little effect except when absorption and heating can occur.

A French worker, Bugard (1952), used a Hartmann whistle which, when properly tuned, gave almost pure sounds of about 130 decibels but badly tuned gave a wide spectral range with a large audible component and an average output of 105 decibels. He found that the former condition was not disagreeable if in the ultrasonic range; but the latter was by contrast most unpleasant. He was unable to separate the audible and inaudible components.

There have been several reports suggesting that ultrasonic sounds can be heard by the ear by bone conduction (Gavreau, 1948; Keitz, 1951). However, the pitch heard appears to be the highest frequency that a particular ear can hear, and consequently can vary, not only from person to person, but in the two ears of the same person (Deatherbridge *et alii*, 1954). Only very intense sounds will give this result (1000 dynes per square centimetre, contrasted with 0·0002 dyne per square centimetre at threshold). Zangemeister (1951) has found that subjects with nerve damage involving the basal turn do not hear ultrasonics by bone conduction.

An explanation of this seeming paradox—no sound by air conduction, but a pitch by bone conduction—appears to lie in the impedance match between high-frequency sound in air and the ear drum. We have tried to measure the reflective properties of the drum, and although we have not been successful, we believe that there must be almost complete reflection.

The reflection from skin is 99% (von Gierke, 1949; Kendricks, 1954), although absorption as heat can occur in crevices or hirsute areas.

Thus, to summarize, it is probably true to say that airborne ultrasonic sounds are totally reflected from the surface of the ear drum, and do not enter the inner ear.

Any ill effects seen in jet aircraft workers appear to be due to audible sounds of very high intensity.

I hope you will bear with me if I turn for a few moments to the physiology of hearing and recapitulate a few fundamental points.

All observers agree (i) that the position along the cochlea canal or basilar membrane plays some part in identifying pitch; (ii) that sound enters the perilymphatic fluid through the oval window, and progresses as a disturbance into the cochlea because of the pliability of the round window; (iii) that the physical disturbance travels to the far end near the helicotrema in low notes, but stops short when higher pitches are presented; (iv) that the disturbance, to reach the far end, must have passed over the near end of the membrane.

Studies of short pulses of sound have given the following information: (i) A note of less than five milliseconds cannot be identified for pitch. (ii) If a note exceeds 10 milliseconds, the pitch is identifiable, but does not reach full loudness under 150 to 200 milliseconds, unless it is very loud, when 65 milliseconds will suffice to reach full amplitude.

Studies of longer signals have shown that any signal lasting several minutes appears to reach full loudness at 150 milliseconds, but begins to lose intensity after quite a short time (0·2 to 0·4 second), and this phenomenon has been called initial adaptation—the steady state or equilibration of the sense organ. Recovery of full sensitivity takes only 150 milliseconds. If either weak or strong signals persist for several minutes continuously, there will occur, forty-five to sixty seconds after initial adaptation, a second decrease in intensity—perstimulatory or loudness adaptation—and recovery from this state is much longer, taking one to two minutes. During stimulation, masking for nearby frequencies can be demonstrated. Finally, if signals over 90 decibels have persisted for ten minutes or more, an after-effect is found, lasting minutes or hours. Testing reveals a hearing loss for sounds extending over a range up to two octaves above the stimulating frequency —fatigue or post-stimulatory fatigue. If the original threshold at the higher frequencies is now 30 decibels up on the preexposure threshold, slight increase in intensity above this figure (30 decibels) will cause a sudden return to normal—that is, recruitment. Loudness adaptation can still be demonstrated at frequencies showing recruitment.

Persistent exposure or repeated exposure to loud sounds may give rise to permanent destruction of portions of the cochlea duct and permanent hearing loss at frequencies higher than the primary tone, and is classified as trauma (Van Dishoeck, 1953; Luscher and Zwislocki, 1947; Hood, 1950; Davis, 1950).

The intraaural muscles have been studied by Wiggers (1937), Lorente de Nó (1932), Hueter *et alii* (1956) and Fry (1952). The functions of the *tensor tympani* and the stapedius have been the subject of argument for many years, but are probably two in number: (i) to protect the inner ear from too violent excursions, and (ii) to increase the sensitivity of the conduction system for high tones.

The muscles in each ear are involved in a crossed reflex requiring only ten to fifteen milliseconds of sound to initiate contraction. A sound in one ear can provoke contraction, not only on the same side, but in the opposite ear as well. Sounds of 60 to 70 decibels will provoke the reflex.

A measure of voluntary control is seen when, in anticipating a loud sound, one screws up the eyes and clenches the jaw; the intraaural muscle contractions are heard as a crackle in the ear.

The reflex contraction is rhythmic in nature, but relaxes and disappears with a time relationship which coincides with the onset of loudness adaptation.

In patients with unilateral facial nerve paralysis in which the stapedius muscle is paralysed on one side, a state of hyperacusis occurs on that side; but within forty-five to sixty seconds from the onset of a tone, both ears give an equal response subjectively, as initial and loudness adaptation come into action in the affected as well as in the unaffected ear.

Studies on Audible Sound.

A conversation held with a number of engineers from the Commonwealth Aircraft Corporation at Fishermen's Bend, Victoria, confirmed other reports that personnel subjected daily to jet engine testing were disturbed both physically and emotionally. However, they were unable to distinguish between audible and inaudible components. They considered that "rough running" jets were more disturbing than "smooth running" jets. The emphasis appeared to be on sounds sudden in onset, short in duration and irregular in spacing. In consequence, it seemed worthwhile to expose ourselves to high audible sounds of short duration.

Because of natural resonances in the system of an oscillator and headphones, a tone of 1200 cycles was keyed at varying intensities, in view of the observation that the

department telephone was most unpleasant when the cord was first plugged into the jack by the operator.

Slow Repetition Rates.

At slow repetition rates and durations of ten to fifty milliseconds, and according to the emotional characteristics of the subject, the following signs and symptoms were identified:

1. As the intensity was slowly increased, the following reactions were identified: eye blinking, protective "screwing up" of the lids, and finally, with still louder sounds, a generalized muscular tensing best described as flinching—a "startled" effect.

2. Exposure for any length of time to sounds of loud intensity left a general feeling of malaise and in some cases slight nausea. Temporary partial deafness was noticed, which lasted for some hours.

3. At an unknown but definite level of intensity, if blinking was voluntarily suppressed, the distant visual image was seen to move momentarily to one or other side, depending on which ear was exposed, or moved upwards if both ears were involved simultaneously. If the right ear was exposed, the image moved to the right and slightly upward; if the left ear was exposed, the image moved to the left and slightly upward; if both ears were exposed, the image moved upward centrally. In some subjects, the horizontal movement had a downward vector.

The question arose, was this a vestibulo-ocular or a cochleo-ocular phenomenon?

Tests for Vestibular Involvement.

If this reaction was due to a vestibular disturbance, it should be possible, by rotating a subject in one direction and thereby producing post-rotary nystagmus, to apply the sound to the appropriate ear and to influence the rotational nystagmus.

Tests showed that auditory stimuli did cause a hesitation in the slow component, which was of momentary duration only. The period of nystagmus was many times longer than the period of eye movement, so that the nystagmus proceeded with but a momentary pause, depending on the time of arrival of the auditory stimulus. This hesitation could not be increased in length if the signal was made longer. If the rate of repetition was increased, the intensity being maintained constant, the "hesitation effect" was found to disappear when a critical value was reached.

The pupil of the eye was observed under a binocular microscope with a magnification of 11; but apart from a reflex contraction of the pupil, there was no sign of the eyeball moving. However, at this magnification, it is possible that the amount of movement is too small to be seen.

If the head was rotated through varying degrees up to 90°, what effect would be found? Up to about 30°, the eye compensated and the apparent image movement remained horizontal with its slight upward component. As further rotation occurred, the movement became more and more vertical, and the eye muscles having reached the limit of compensation, the eyeball was being carried by the general rotation of the head. It was concluded at that time that the effect was not in the eyes themselves, but more central. However, the total movement was probably so small that it was noticeable only when the object being observed was 1000 yards or more away—that is, a very long leverage was required to amplify the movement. The rotation had not altered the relative change between eye and head position.

Attention was then given to why the duration of that effect was so short, and why the effect disappeared if the rate was increased. A new test was evolved. A short pulse, whose repetition rate could be increased by slow steps, was fed to both ear phones, and by the use of the upward movement as an end point, the following effects were noted. At a rate of one pulse every five seconds, the intensity was turned up until the movement was identified. The rate was increased and the movement was found to disappear. The intensity was further increased until the movement returned. This was repeated until the overall intensity was so loud as to be unbearable. The rate of repetition by this time had reached 4·2 times per second. It became essential to know the influence of wave shape on subjective sensation and eye movement, and a further series of experiments was planned.

Study of the Waveshape of Single and Repeated Pulses.

A dual channel pulser was built which allowed change of shape as well as variation in the length of signal. Pulses could follow one another with varying time intervals between, or, if only one channel was used, single pulses of varying length could be repeated at different rates.

The usual carrier frequency used was 1000 cycles.

Single Pulses.—In Figure I will be seen the envelopes of the wave forms investigated.

The following findings are set out in Diagram 1 (Figure I): (*a*) A pulse of five milliseconds was heard as a sharp click. (*b*) A pulse of ten to fifteen milliseconds started with a click, but pitch was identifiable—that is, click-pitch. (*c*) A pulse over twenty milliseconds long appeared as pitch alone, although by very careful listening mild clicks could be identified at both the beginning and the end.

If the shape of the front is altered so that several cycles occur before full amplitude is attained, the subjective sound can be described as follows (Diagram 2, Figure I): (*a*) The five milliseconds pulse was reduced in harshness and the click practically disappeared. (*b*) The ten to fifteen milliseconds pulse was now pure pitch. (*c*) The over twenty milliseconds pulse was also pure pitch.

In Diagram 3 (Figure I), two short pulses of about five to seven milliseconds follow one another with varying time intervals, as follows: (*a*) Two separate clicks of equal intensity were heard. (*b*) The two were either heard as two clicks, the first being louder than the second, or, if they were brought slightly closer together, click and pitch could be identified. (*c*) The two summated were heard as a single click; or, if the summated pair totalled a long enough signal, pitch was heard as in (*c*), Diagrams 1 and 2 (Figure I).

Trains of Pulses.—The following observations are set out in Diagram 4 (Figure I). If a train of short pulses was allowed to run for several minute intervals and the repetition rate was changed from time to time—that is, if the spacing between pulses was shortened—the results were as follows: (*a*) Five millisecond pulses were heard as separate clicks, pitch was unidentifiable, but, as the repetition was increased, a buzz was heard which had some resemblance to tone of harsh quality. (*b*) If now the pulsed frequency, as distinct from the repetition rate, was altered continuously up to 4000 cycles, the buzz would alter in pitch to a higher frequency.

As will be seen in Diagram 5 (Figure I), if two sets of pulses of the same fundamental tone (1000 cycles) were spaced one inside the other, then there was heard a buzz tone, a continuous 1000 cycle note and a click rate.

If the waveform as shown in Diagram 6 (Figure I) was listened to, it was heard as twin clicks on a buzz background.

Pulses on a Background of Sound.—In Diagram 7 (Figure I), a continuous tone with a pulse of similar frequency appearing periodically was used: (*a*) it was heard as a click on top of a continuous signal; (*b*) just after the click there was some masking of the continuous note.

If, as in Diagram 8 (Figure I), the proportion of steady signal to pulse was kept the same, the loudness of the click increased in (*b*) and (*c*), the ear adjusted its threshold to the continuous tone, and the pulse signal was heard above this background. Some masking of the continuous signal followed the click.

Later experiments showed that the final rate reached was dependent on the duration of the individual signals; that is, the shorter the signal time, the more the time for recovery between stimuli. If an intensity, which at a particular rate of repetition did not produce movement,

was slowed sufficiently, then every pulse produced the disturbance in a gross manner. If that same intensity was made a continuous signal, then only just at the commencement did the movement occur, but it did not reappear no matter how long the signal lasted. If, as occurred accidentally once or twice, the maximum continuous signal was changed suddenly to an interrupted signal of the same intensity, the subject jumped from the seat and cried out involuntarily with pain and shock.

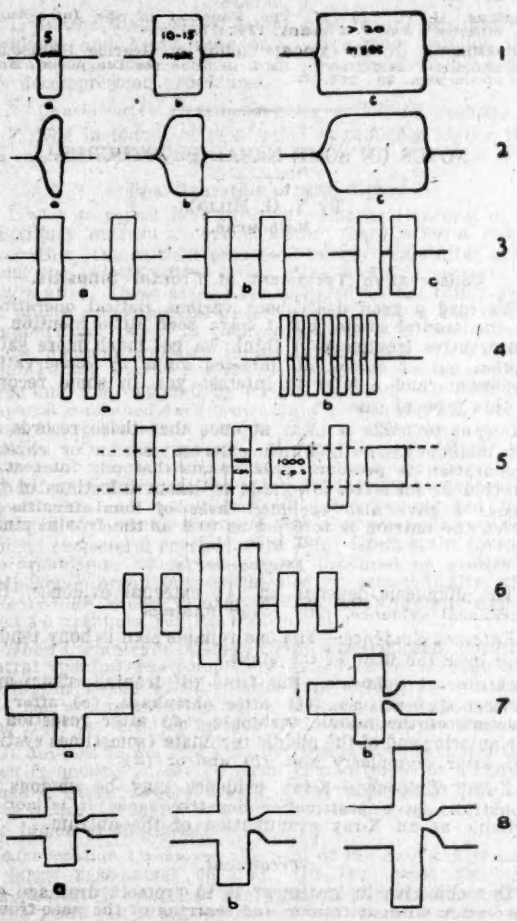

FIGURE I: Diagrams 1 to 8.

The commencement of any signal of sudden onset, if loud enough, will be heard as a click, and will produce eye movements or even the "startle" effect. Thus both intensity and rate of change of intensity are of importance.

Although the eye movements *per se* are not of great practical importance, they were a useful end point for measuring purposes. From the foregoing, it can be deduced that even though loudness adaptation can protect the ear from continuous loud background noise up to certain limits, sudden sharp sounds of only a few milliseconds' duration can and do slip by the protection of the intraaural muscles which have just come into play as the stimulus fades.

If the loud pulses followed one another regularly, fusion with subsequent loudness adaptation would give protection. However, the sudden rise and fall of intensity left the cochlea defenceless.

Conclusions.

The disturbing effects of loud *staccato* sounds are probably due to the click or "on" effect causing over-stimulation of the unprotected inner ear, and consequent bombardment of the central nervous system, before the protective devices of the ear have had time to make full adjustment. With each incoming sound rapidly changing in intensity, the protection of a previous stimulus is lost, and the inner ear is caught unprepared by the subsequent burst of noise.

At intensities above 140 decibels, even if the sound is continuous, the protection afforded is insufficient, and traumatization can and does occur. The bursting of an ear drum in one research worker has been reported at very high intensities and is a further mechanical hazard.

Until more is known of the actual methods by which the ear interprets, codes and distributes the incoming information, I do not believe that a full explanation of the general systemic effects can be given. However, the obvious way to attack the problem is to attenuate the sound and protect the ear with ear defenders. The wearing of suitable and properly fitted protectors is becoming compulsory for all personnel required to work in sound fields above prescribed limits.

ULTRASONICS TRANSMITTED BY FLUID OR SOLID CONDUCTION.

The subject of ultrasonics transmitted by fluid or solid conduction is extensive and complicated. It can be briefly discussed by division into the following subheadings.

Transducers.

The most commonly used transducers are quartz crystals ground to give frequencies from 100 kilocycles up to 15 megacycles, and applied to the surface of the body by contact with a thin or thick layer of fluid between source and receiver. Focusing devices of plastic can be used to produce focused beams for specific purposes. Large amounts of power can be dissipated by these transducers.

Properties of Ultrasonic Vibrations.

Ultrasonic vibrations exhibit all the physical properties of other wave systems—namely, refraction, reflection, diffraction and absorption—but also exhibit great mechanical forces, which may amount to several atmospheres.

Biological Effects.

The biological effects are dependent on the physical properties, the most important being that of absorption, by which the energy is transformed directly to heat.

The properties of refraction, reflection and diffraction allow concentration of vibrations at small focal points often unknown to the operator, and may constitute an unrecognized hazard.

The danger of gaseous or vaporous cavitation is very real. The acceleration of the elementary particles of a medium with forces 100,000 times gravity, repeated many millions of times per second, may pull the particles of a fluid apart, allowing gases or vapour to collect, and in turn cause physical disruption.

Uses in Medicine.

The heating effect has been used in a similar way to diathermy. However, warnings (Lorente de Nó, 1932) have been issued as to the unknown concentrating effects in bone and by inadvertent reflections from structure surfaces. Specific effects reported from ultrasound can usually be duplicated by heat alone.

Ultrasound has been used as an echo-sounding device to identify gall-stones (Anonymous, 1950) and other solid or foreign bodies, and to tell the thickness of tissues and the extent of tumours.

It has been used also as a focused beam to destroy, probably by local heating, specific areas of tissue, particularly brain tissue (Lehmann, 1952). Of particular interest in this direction is the use of a probe type transducer by Arslan (1944) for destroying specific areas of the internal ear in cases of Ménière's disease.

Ultrasound has also been employed to homogenize biological material, to sterilize, to mix immiscible fluids, and to bring into close apposition chemicals which unite only at a surface (the diffusion layer is decreased by stirring).

SUMMARY.

1. As a result of animal and human experiments, there is no reason to believe that ultrasonic air-borne sounds actually penetrate or affect the cochlea or vestibular mechanisms of the inner ear.

2. When ill effects do occur, then the sound is within the auditory range of the species under consideration.

3. Loud, audible sounds of short duration and high intensity can produce generalized systemic disturbances by over-stimulation of the unprotected ear.

4. The use of suitable ear defenders is obligatory for workers constantly exposed to jet engine noise.

5. A brief review has been given of the properties of ultrasonic vibrations and their use in medicine.

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NOTES ON SOME NASAL PROCEDURES.[1]

By T. G. MILLAR,

Melbourne.

Conservative Treatment of Frontal Sinusitis.

We read a good deal about various radical operations on the frontal sinus, but I have seen little mention of conservative treatment. I think we get much more satisfaction out of curing an infected sinus by conservative treatment, and I hope to interest you in some records of this type of case.

I want to make it clear at once that these records do not include cases in which external œdema or chronic suppuration is present. This means that our interest is directed to subacute, low-grade or latent infections of the sinus. I have also excluded cases of hemi-sinusitis in which the antrum is infected as well as the frontal sinus.

Diagnosis.

The diagnosis depends on (1) external evidence, (ii) intranasal evidence, (iii) X-ray findings.

External Evidence.—The one reliable sign is bony tenderness over the floor of the sinus.

Intranasal Evidence.—Pus from the frontal ostium may be seen (*a*) at once, (*b*) after shrinkage, (*c*) after infracture of the middle turbinate, (*d*) after resection of the anterior end of the middle turbinate (sometimes cystic), (*e*) after septoplasty *plus* (*c*) and/or (*d*).

X-Ray Evidence.—X-ray evidence may be obvious or doubtful. In a positive or negative sense it is not as reliable as an X-ray examination of the antrum.

Treatment.

Our objective in treatment is to promote drainage and resolution without trauma and scarring of the naso-frontal duct. Injury to the latter must be carefully avoided. In some cases the condition responds to the steps taken to discover intranasal evidence of infection—that is, (*a*) shrinkage, (*b*) infracture of the middle turbinate, (*c*) resection of the anterior end of the middle turbinate, or (*d*) septoplasty *plus* (*b*) and/or (*c*). These steps may be called "intranasal decompression". There remain some cases in which one has to choose between catheterization and the making of an external trephine opening.

Catheterization.—A frontal sinus probe is used to discover whether the duct can be catheterized. It may or may not be possible to find the duct until the "decompression" procedure has been carried out. If the probe passes along the duct fairly easily, then one can be confident of passing a cannula. I use two types of cannula, a metal cannula or a gum elastic ureteric catheter number 5. The position of the cannula may be checked radiologically. After insertion of the cannula one can proceed with irrigation followed by insertion of antibiotic solutions such as procaine-penicillin. Until this stage in

[1] Read at a meeting of the Oto-laryngological Society of Australia (British Medical Association), Adelaide, August, 1956.

treatment all procedures except septoplasty can be carried out in one's rooms.

External Trephining.—External trephining is performed when catheterization fails, and requires the patient's admission to hospital. A small circular opening is made into the sinus at the medial end of the eyebrow, but towards the floor of the sinus, and this opening is used to irrigate the sinus every few days until the fronto-nasal duct opens and the irrigating fluid passes freely into the nose.

Summary.

1. In the diagnosis of latent frontal sinusitis, external evidence and X-ray examination are more reliable than intranasal evidence. The latter may have to be sought by decompression procedures.

2. Conservative treatment gives satisfying results.

3. The incidence of reinfection is probably higher than in cases of maxillary sinusitis.

Post-Operative Antral Cysts.

I wish to report four cases of post-operative cyst of the maxillary antrum occurring many years after a radical operation. One patient presented twenty years after operation, one patient fifteen years after, and two patients ten years after. These cases have occurred during thirty years of practice and therefore represent probably a 1% or less complication rate. In each case the cyst presented as a tight, fluctuant swelling in the canine fossa. In one case the swelling was so low that it was diagnosed as a dental cyst and was explored by an oral surgeon. In each case the cyst contained dark brown fluid, and in the most recent case the pathological report (Dr. K. Schwarz) was as follows. On macroscopic examination the fluid was extremely viscous and brownish, and did not separate on centrifugation; on microscopic examination numerous red blood cells and endothelial cells showing marked fatty changes were seen; scattered pus cells were also present, but no cholesterol crystals were seen; Gram stain revealed no organisms; attempted culture produced no growth of pathogenic organisms aerobically or anaerobically after twenty-four hours' incubation; the total protein content was 6·5 grammes per 100 millilitres.

When the antrum in these cases was reopened, the naso-antral opening was completely walled off by a tough wall of fibrous tissue which appeared to have grown in from the periosteum covering the anterior wall of the antrum and from the anterior margin of the naso-antral opening.

It appears to me that the cyst formation resembles that seen frequently in the posterior compartment of a radical mastoid cavity, where a cyst forms underneath the new skin lining the cavity and sooner or later projects towards the lumen of the cavity.

At operation I removed the wall of the cyst and remade a large naso-antral opening. In two cases the cyst reappeared, in one after five years and in the other after seven years. In these two cases I left the wall of the cyst and remade the naso-antral opening.

Since the appearance of these cases I have made the following modifications in the technique of the radical operation: (i) the naso-antral opening is not extended forwards beyond the anterior end of the inferior turbinate, but is extended posteriorly as far as possible. (ii) When the antrum has a deep antero-medial angle, removal of overhanging anterior wall for access to degenerated mucosa is not carried beyond what is absolutely necessary for access.

Post-Nasal Packing for Hæmorrhage.

This note on post-nasal packing for hæmorrhage is inspired by an excellent diagram in Carruthers's text-book on the ear, nose and throat; but my appeal is for the use of two tapes for the following reasons:

1. When there are two tapes, fixation of the pack may be obtained in two ways: (*a*) with one tape through each nasal passage, by tying them over a pad of gauze on the columella; (*b*) with two tapes through one nasal passage, by tying them over a small batten across the anterior naris. I think the former is more effective.

2. When one tape is used, the single tape must be fixed to the cheek by strapping, and I have seen cases of fissuring of the angle of the naris which has taken weeks to heal. I have also been called to cases in which the pack has slipped owing to ineffective fixation.

No other tapes are necessary, such as one from the pack coming out through the mouth and apparently used for removal. Any pack can be grasped easily and removed by long curved Spencer Wells forceps.

The pack will be used in cases of epistaxis or adenoid hæmorrhage.

In cases of epistaxis, the post-nasal pack is a base on to which firm anterior packing can be placed well posteriorly without fear that the packing will slip backwards into the naso-pharynx. In these cases the first tape should be drawn through the unaffected side.

In cases of adenoid hæmorrhage, I usually place the pack in position with the patient under general anæsthesia. The soft palate is retracted and the post-nasal area inspected with a laryngeal mirror to localize the bleeding. The pack can be constructed according to the site of the bleeding.

I should like to suggest that a reproduction of Carruthers's diagram (with two tapes) be placed in all casualty departments.

TWISTING OF CARTILAGE IN SADDLE NOSE IMPLANTS.[1]

By A. B. K. WATKINS, M.S. (London), F.R.C.S. (England),
Sydney.

MANY substances, in the past, have been used to fill out the depressions in saddle noses. Some materials, such as paraffin wax or certain types of ivory, have long been proved irritant and to result in subsequent fibrosis. They are no longer used. Bone, tantalum and some acrylics are satisfactory, though of these bone may occasionally become partly or completely absorbed. All three substances result in a hard, rigid nose. Only those who have felt a nose so repaired can form an idea of the shock that contact could produce in romantic situations. Undoubtedly, if it is obtainable, a supple nose is preferable.

The use of cartilage generally has proved a successful means of restoring such deformities, but it has certain disadvantages. If fresh cartilage is removed from the patient, not only does he suffer the moderate discomfort of the nasal operation, but he also has the much greater discomfort of a chest operation, sometimes accompanied by pleural pain on respiration. It is also difficult to remove from the living large enough pieces to make satisfactory one-piece L-shaped grafts to repair, at the same time, the accompanying collapse of the columella. Further—as occasionally happens—should the intended graft slip from the surgeon's grasp whilst it is being shaped, and pass outside the sterile field, the chest wound has to produce a second piece of cartilage.

Even when the graft has been satisfactorily inserted in the nose it may still give trouble. For instance, even when the operation has been performed with every care, at least 10% of grafts become infected. Whenever this happens, the graft will almost certainly liquefy completely or partly.

Occasionally cases have been reported in which the cartilaginous inserts have subsequently bent.

Though I have used autogenous cartilage inserts for over twenty-five years, I have never had one bend or twist. But there is so much literature to show that this may happen that I realize I have been fortunate, and that I

[1] Part of a paper entitled "Problems in Aural and Nasal Reconstruction" read at the annual meeting of the Oto-laryngological Society of Australia (British Medical Association), Adelaide, August, 1956.

would risk being held blameworthy if I used such a graft now and it became distorted afterwards.

It is generally believed that the tendency for an autogenous cartilage graft to bend is greater if all periosteum is not removed first. However, I understand that Gibson (Wallace, 1956) considers that the tendency to bend can be avoided if periosteum is left on three sides of the insert. But to do so would make accurate shaping impossible, and one would have to be content with much less exact work than modern cosmetic surgery demands.

Of recent years it has been found far more convenient to use dead cartilage from another person.

FIGURE I.
Miss A.: Saddle nose before treatment.

The technique involves first finding a deceased subject in a suitable age group. Under sixteen years of age the cartilages are on the small side. Over thirty years of age they tend to become difficult to shape owing to calcification; also the structure is uneven, so that thin pieces tend to break easily. It is usual to select a subject who, otherwise healthy, has died a violent death; but other workers, probably correctly, believe there is no reason why people who

FIGURE II.
Miss A., after warping of preserved cartilage implant and partial correction by division of curled cartilage.

have died of infections with non-spore-bearing organisms should not also be used as donors. In any case, the mortality in this age group is low, so suitable donors are not easily obtained if criteria are too strict.

The sixth and seventh rib cartilages are removed from both sides. To obtain portions of maximum size, pieces of sternum are left attached to each cartilage. This removal is carried out with clean tools in the post-mortem room, but no attempt at an aseptic technique is made. The specimens with periosteum and some muscle are dropped into jars of "Merthiolate" (one in 2000) in normal saline solution.

Within twenty-four hours, though preferably sooner, the cartilages are taken from the jar under full aseptic technique, and all muscle and periosteum is removed.

When cartilages are massive, time can be saved by shaving off the periosteum in slices instead of removing it by dissection. The cleaned cartilages are transferred to another jar of "Merthiolate" solution of the same concentration as before, and from then on they are kept in the "cool" section of the refrigerator. A week or so later they are transferred to one in 5000 "Merthiolate" saline solution.

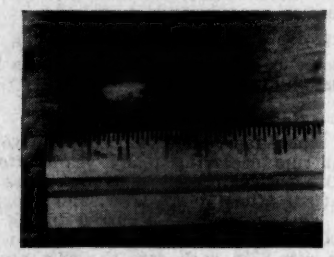

FIGURE III.
The twisted preserved cartilage implant after removal.

Before being used the cartilage is washed in saline and superficial slices are pared off. Cultures are then attempted from these. Apparently enough "Merthiolate" is impregnated in the cartilage to prevent the growth of organisms,

FIGURE IV.
Miss A., after removal of cartilage insert and substitution of tantalum-acrylic insert.

as I have always had these attempted cultures pronounced sterile.

The convenience of such a cartilage bank is considerable. It is stated that cartilage so prepared is fit for use for three months; but Shanasy (1954) states that it is satisfactory for at least twelve months.

I am inclined to think that the tendency for the wound to become infected is slightly higher when dead cartilage is used; but on the other hand dead cartilage when infected does not become absorbed as easily as autogenous cartilage.

One of the greatest advantages of dead cartilage is said to be its complete immunity from twisting after insertion (Brown and McDowell, 1951, and others). This belief is now firmly established and was for some years completely accepted by myself.

The error in this was not discovered until I inserted a bridge and a columellar graft in Miss A., aged twenty-six years, on March 15, 1956 (Figures IA and IB). Within eight days the bridge graft had warped to form the arc of a semicircle. Its upper end presented under the skin opposite the right inner canthus, whilst the lower end deviated the tip of the nose to the right. On March 23, in an attempt to reduce the deformity, I divided the graft subcutaneously with a tenotomy knife. This somewhat diminished the deformity, but the result was not acceptable to myself or the patient (Figures IIA and IIB). On April 4 I removed the graft (Figure III) and inserted a combined tantalum and acrylic insert, which proved more satisfactory, except, of course, for the expected rigidity of the nose (Figures IVA and IVB).

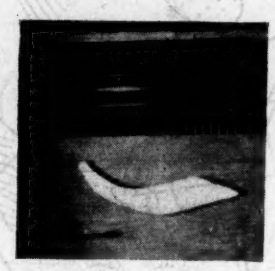

FIGURE V.
Piece of preserved cartilage after becoming warped in tap-water.

In an attempt to discover why this particular piece of dead cartilage had curled, I took from the bank another piece from the same person. After shaping it I placed it in tap water, wondering whether the hypotonicity might affect it. Within a week it had curled, though not quite so much as the specimen used in the patient (Figure V). Thinking the bend was due to the hypotonic nature of the tap water, I expected the curve would become reversed in hypertonic saline solution. This did not prove to be so, and the bend did not alter even when solid salt was packed around the specimen. In other words, an irreversible change had taken place.

Cartilages from other persons were then similarly treated. In most, tap water caused little or no bending. In two pieces the sharpened ends bent slightly.

These experiments suggest that a series of tests might be devised which would demonstrate beforehand which pieces of cartilage might be expected to bend if implanted. Tests are now being carried out with variations of pH, tonicity and temperature. Some time must elapse before conclusions can be drawn.

In the meantime, what alternate means can we use to cure saddle noses and yet leave them supple?

Polythene has been suggested, but the term covers a number of associated plastics. Some produce fibrosis, and are actually used for this purpose in other fields of surgery. This feature would be out of place in saddle nose surgery. It is known that polythene implants in rats cause fibrosarcoma in 12% of cases. Because of the peculiar tissue reactions in rats, this may have no significance in human beings.

"Vitrathene"[1] is a form of polythene of approximately the same suppleness as cartilage. Matthews (1956) informs me that it has been used after boiling. Then, after being shaped, it is reboiled for twenty minutes before insertion. He understands, however, that it has given some trouble with infection.

[1] Manufactured by Stanley Smith and Company, United Kingdom.

It appears, therefore, in the present stage of our knowledge that we might be well advised temporarily to avoid using cartilage or synthetic pliable materials to repair saddle noses. This means contenting ourselves with rigid implants.

On the other hand, those of us interested should continue a search for a means of determining beforehand which specimens of cartilage might bend if inserted. Also, we should attempt to find a means to reduce the tendency of wounds to become infected after cartilage insertion.

Summary.

The belief that preserved cartilage cannot bend after insertion in saddle noses is disproved. No attempt has been made to discuss or describe the operative technique of shaping or inserting the grafts, nor to deal with the accompanying problem of correcting the collapse of the columella.

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INTERNAL SUPRAHYOID CYSTS IN INFANCY.[1]

By THE LATE S. PEARLMAN,
Adelaide.

THE occurrence of dyspnœa in infants is of interest to laryngologists as well as to pædiatricians, and I present this paper to stress the importance of an unusual cyst situated at the base of the tongue just above the epiglottis, with symptoms of dyspnœa and feeding difficulties commencing shortly after birth. There is little reference to this type of condition in the literature. I have previously described three such cases (1947), and I now describe a fourth case.

A., a male child, was born on January 18, 1956. At the age of six weeks he developed difficulty in breathing without cyanosis, and also difficulty in feeding, with occasional vomiting. With a finger inserted in the mouth, a smooth, tense, cystic swelling could be felt at the base of the tongue. Direct laryngoscopic examination revealed an oval cyst lying transversely in the lingual tonsil region; it was about one inch by half an inch in size, smooth in outline and bluish in appearance. It appeared to push the epiglottis backwards, partially closing the laryngeal aperture. On March 29, 1956, the baby came to operation when ten weeks old. A transverse incision was made in the skin of the neck just above the hyoid bone. The cyst was exposed by dissection through the suprahyoid tongue muscles with the assistance of a finger inserted in the mouth. The cyst ruptured shortly before removal, with the discharge of a glairy fluid. Centrally, the cyst wall was fused with the pharyngeal mucosa, which was opened. This opening was sutured with catgut, the tongue muscles were drawn together, and the wound was closed without drainage. Stridor developed after the operation, apparently due to the endotracheal anæsthetic tube, and tracheotomy became necessary twelve hours later. The baby's general condition was poor for two days, but from then on recovery was uninterrupted, and he was discharged from hospital on the twelfth day. A biopsy of the cyst was reported on as follows:

> A lining of flattened squamous epithelium in a stroma of striated muscle and fibrous tissue. The findings are consistent with a cyst of the thyroglossal duct, or a simple cyst of a mucous gland.

This case is similar to the three cases previously described. All bear a striking similarity in signs and symptoms. The previous three patients were female children. The onset of symptoms occurred shortly after

[1] Read at the annual meeting of the Oto-laryngological Society of Australia (British Medical Association), Adelaide, August, 1956.

birth; all were completely cured by the removal of the cysts, which were identical in size, shape, position and consistency. The diagnosis was effected by palpating the cysts at the base of the tongue. This procedure is now carried out as a routine in all cases of stridor in infants. There were no external signs. Careful laryngoscopic examination is helpful in diagnosis, and I would stress "careful" because, if it is careless, the cyst may be missed.

It is assumed that these cysts are thyro-glossal in nature. However, I should mention that there is a possibility that they may be simple cysts of mucoid glands, or even accessory salivary glands. The biopsy report in one case was that the material was an accessory salivary gland with congested and dilated ducts full of secretion (J. B. Thiersch).

Thyro-Glossal Duct Cysts.

A few remarks in general about thyro-glossal cysts are pertinent to this paper. The thyroid gland develops early in fœtal life. At the fourth week an evagination appears in the mid-line of the floor of the primitive pharynx at the site of the *tuberculum impar*; this evagination continues down to the region below the future thyroid cartilage, where the isthmus and lateral lobes of the thyroid gland develop (Figure I). The thyro-glossal duct so formed

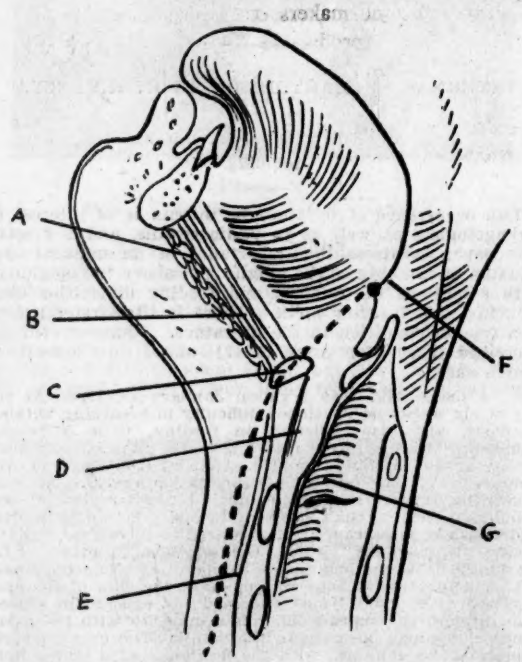

FIGURE I.
Thyro-glossal tract.

closes by the seventh week. Arrest of development may result in the formation of aberrant thyroid tissue anywhere in the course of the duct. The hyoid bone and tongue muscles develop a little later, and envelope the duct in their growth. If the duct fails to be obliterated, cysts may form anywhere along its path from epithelial rests.

Thyro-glossal cysts may develop at any age. In a series of 128 cases, Nachlas, of Boston (1950), noted their occurrence between the ages of five months and seventy-seven years; 60% occur between birth and the tenth year. They occur always in or near the mid-line, and about 25% are suprahyoid (Figure II). In a report of 105 cases from the Johns Hopkins Hospital (Ward, Hendrick and Chambers, 1949), there were four lesions in the tongue, all of which were removed intraorally. It seems that these patients were not infants. Of 309 cases at the Children's Hospital, Boston, Gross (1953) records three as intraoral swellings near the *foramen caecum*; the excision was performed through the mouth. In 92 cases, Hamilton Bailey (1925) could find a record of only one in which the cyst occurred at the base of the tongue beneath the *foramen caecum*. He made the following comment:

> Rare as this situation is for a thyroglossal cyst, it is the situation *par excellence* for an ectopic thyroid.

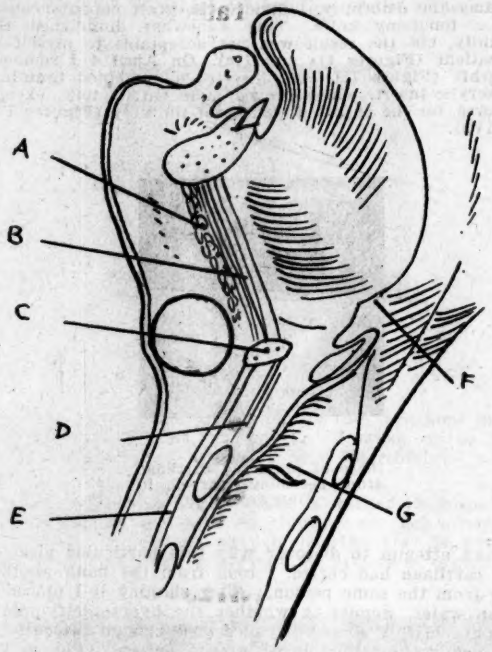

FIGURE II.
Usual site of thyro-glossal cysts.

A. P. Bertwistle (1925) recorded the case of a five weeks old baby, who was admitted to hospital suffering from difficulty in swallowing. The child had several attacks of dyspnœa, and died in one such attack five days after admission to hospital. Post-mortem examination revealed a cyst at the site of the *foramen caecum* between the hyoid and the base of the tongue. It did not contain thyroid tissue.

I would stress the occurrence of thyroid tissue anywhere along the course of the duct, although this is an uncommon condition. The thyroid gland may be absent from its usual situation. The common sites for an ectopic thyroid are in the substance of the tongue, or beneath the skin close to the hyoid bone. When possible, it is necessary to assess the presence of the thyroid gland in its normal situation before removal of thyro-glossal cysts. The use of radio-active iodine in this regard may be useful. During the removal of the cyst, and before the blood supply is completely severed, an estimate should be made to make sure that the tumour is truly cystic, if necessary by making an incision in it. If there is still doubt, a small incision should be made over the usual site of the thyroid gland to confirm its presence there (Gross, 1953). This particularly applies to the removal of the cysts described in this paper, as their site is that of the so-called lingual thyroids. Ward, Hendrick and Chambers (1949) describe the removal of a cyst in the region of the *foramen caecum* in a boy, aged fourteen years. It contained thyroid tissue, and four months later he presented with hypothyroidism. He was still taking thyroid tablets twenty-one years later.

In the presence of a lingual thyroid, one of the following three courses is open to the surgeon:

1. If symptoms demand it, complete removal is indicated. This will avoid recurrence or the formation of a sinus (which is likely to be persistent), and appears to be the procedure of choice.

2. If there are no symptoms, it should be left alone.

3. Some surgeons prefer to leave part of the tissue. However, it is acknowledged that future attempts at removal would prove difficult. Physicians seem to be quite happy about maintaining myxœdematous patients in good health by replacement therapy. The grafting of part of the tissue into other areas does not appear to meet with success.

The accepted treatment for thyro-glossal cysts is complete surgical removal. The present trend is to remove these cysts on diagnosis to avoid the complication of

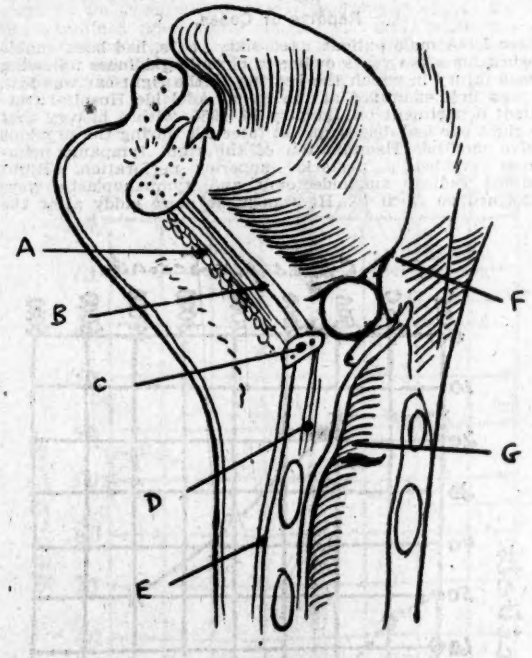

FIGURE III.

Site of internal suprahyoid cysts: A, mylo-hyoid muscle; B, genio-hyoid muscle; C, hyoid bone; D, thyro-hyoid membrane; E, sterno-hyoid muscle; F, *foramen caecum*; G, larynx.

infection and sinus formation, and resulting disfigurement. Incision of an uninfected cyst is never justified. However, according to Nachlas (1950), excision should never be performed before the age of six years. He states that drainage and palliative treatment should be the rule before this age. He gives no reasons for this assertion. With cysts at or below the hyoid bone, it is necessary to remove the epithelial tract, including a one-centimetre block of central hyoid bone, and a core of soft tissue, upwards and backwards, at an angle of 45°, to the *foramen caecum* (Sistrunk, 1920). Ward, Hendrick and Chambers did not remove any hyoid bone in their 28 cases of suprahyoid cyst, but they did remove the core of soft tissue to the *foramen caecum*. In these cases there were no recurrences.

In the surgery of thyro-glossal cysts in infants referred to in this paper, I believe an external approach is imperative; it would seem to be impossible to remove them intraorally in babies (Figure III). A transverse incision is to be preferred to a vertical one on cosmetic grounds. I believe the cysts in these cases are fused to the mucosa at the site of the *foramen caecum*, and hence an opening into the pharynx is unavoidable. A small drainage tube is preferably inserted and left in for two days.

Differential Diagnosis.

It is necessary to consider the following conditions which may cause dyspnœa in infants:

1. Congenital laryngeal stridor. Any of the following conditions must be excluded by laryngoscopic examination (Chevalier Jackson, 1937): (*a*) over-developed epiglottis; (*b*) laryngomalacia (nutritional) with flaccid epiglottis; (*c*) congenital web of the larynx; (*d*) bilateral recurrent paralysis due to birth injury; (*e*) birth injury to the laryngeal structures (arytenoids, *et cetera*); (*f*) congenital papilloma of the larynx.

2. Impaction of a foreign body in the larynx, trachea or œsophagus.

3. Tumours producing compression (thyroid, thymus, dermoid cyst, *et cetera*).

4. Inflammatory conditions, acute, subacute or chronic, producing glottic or subglottic œdema.

Conclusion.

The treatment of internal suprahyoid cysts may become a matter of urgency owing to dyspnœa. If left untreated, the baby may die, as in Bertwistle's case, or the condition may be relieved by spontaneous rupture, with resultant cure or sinus formation. No doubt smaller cysts causing minor degrees of stridor occur and the symptoms disappear with the increased growth of the child.

Abnormalities arising from the thyro-glossal duct are the commonest developmental abnormalities in the neck; of these abnormalities, only those internal suprahyoid cysts described in this paper are fraught with danger to life.

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TYMPANOPLASTY: A PRELIMINARY REPORT.[1]

By R. N. REILLY, M.B., B.S., D.L.O., F.R.A.C.S.,
Adelaide.

AT a meeting of the Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum in London in August, 1954, H. Wullstein, of Siegen, delivered a paper entitled "Audiology of Hearing —Improvement Operations", in which he described the use of free skin grafts to the remains of the tympanic membrane as a means of improving hearing, in particular following mastoidectomy, and at the 52nd French Congress of Oto-Rhino-Laryngology in Paris in October, 1954, he presented a further paper entitled "The Functions of the Free Skin Graft Compared with those of the Normal Membrane". As I was fortunate enough to hear both of these papers, I have attempted to follow his technique since my return to Australia, and now present a report of the first eight cases.

[1] Read at the annual meeting of the Oto-laryngological Society of Australia (British Medical Association), Adelaide, August, 1956.

Objects.

Wullstein aimed in particular at improving hearing above that which followed the older type of operation in cases of chronic middle-ear and mastoid infection, by reforming the middle ear cleft, but without the extension into the mastoid bone which follows pneumatization.

The improvement in hearing appears to follow this re-creation of the middle-ear space, and possibly something is gained by a columellar effect from attachment of the graft to the neck of the stapes, which must occur in a number of cases.

An incidental object is that of obtaining a dry ear after mastoidectomy—not that this aim is new, but it seems nearer to realization because the Eustachian tube is closed off from the mastoid cavity.

Type of Case.

The type of case suitable for this operation is the one which calls for radical or modified radical mastoidectomy, in which there is present at least one-third of the *pars tensa* of the tympanic membrane, and in which that third is healthy and is placed antero-inferiorly.

Method.

It is usual to use a posterior incision, because it fits in with the obtaining of the graft from the skin over the mastoid; but there is no real reason why one should not approach the mastoid by an endaural incision and make the posterior incision purely for the purpose of obtaining the graft.

The usual bone and plastic meatal work is carried out as in any radical or modified radical mastoidectomy. The outer attic wall is taken down over its full extent. The incus and affected part of the malleus are removed, as is the unhealthy portion of the tympanic membrane. The cavity of the middle ear is then inspected, and any granulations and adhesions are removed. The cavity is then dried and hæmorrhage controlled.

Magnification for work in the middle ear region is obtained by using a Storz binocular loupe.

At this stage the posterior incision is extended to embrace an inverted pear-shaped piece of skin, approximately one and one-half inches long and three-quarters of an inch wide, lying posterior and inferior to the original incision. This piece of skin is removed, denuded of all fat and subcutis, and placed in warm physiological saline to await later use. The edges of the pear-shaped incision are freely undercut to permit easy closure. Hæmostasis is secured, and this inferior part of the wound is covered by an abdominal sponge wrung out of warm saline.

Gelatin sponge, size 3, is now cut into small portions a few millimetres in each diameter and immersed in physiological saline, in each 10 cubic centimetres of which has been dissolved 100,000 units of penicillin and one gramme of streptomycin (or other antibiotic as indicated by pre-operative bacteriological examination).

The cavity of the middle ear is again inspected and any blood clot removed. The space is then packed with the soaked pieces of gelatin sponge, and a layer is placed over the medial wall of the attic up to the aditus. The graft is then taken, and a portion is cut from the "stem" end of the "pear" of such a size that it fits over the remains of the drum and covers in the whole middle-ear space, with the "stem" lying back through the aditus into the antrum. The remainder of the graft is then placed as a lining in the cavity of the mastoid. A layer of gelatin sponge soaked in penicillin-streptomycin solution is placed over both pieces of the graft and the whole is packed into position with half-inch paraffin gauze introduced through the meatus.

The posterior wound is closed with vertical mattress sutures, and a mastoid dressing is applied and secured by a two-inch *crêpe* bandage. Penicillin is given post-operatively as a routine measure in doses of 1,000,000 units per day for six days, unless contraindicated bacteriologically. The dressing is left undisturbed for a week. At the end of this time it is taken down in the operating theatre, with full aseptic precautions. The packing is removed and the graft is inspected. Any loose gelatin sponge is removed, and a fresh pack of half-inch paraffin gauze is put in. The skin sutures are removed, and a mastoid dressing is applied and secured by a two-inch *crêpe* bandage.

This procedure is repeated at the end of the second post-operative week. At the end of the third post-operative week the dressing is taken down, the packing is removed and the cavity is cleaned and left open. Thereafter it is tended in the manner usual for such cavities.

Soon after this time, that part of the graft overlying the remains of the drum starts to shed its epithelium and becomes obviously thinner. This thinning process gradually spreads upwards and backwards, until at about the third post-operative month the graft overlying the area of the middle ear has assumed an appearance not unlike that of slightly thickened tympanic membrane. About this time the patient begins to notice an improvement in hearing and the audiometric curve starts to rise.

Reports of Cases.

CASE I.—A male patient, aged sixty years, had been unable to work for some years owing to chronic giddiness following a head injury in which the hearing in the right ear was lost. He was first examined at the Royal Adelaide Hospital Out-patient department on January 14, 1955, with a history that the right ear had discharged at intervals during the previous twelve months. Examination of the right tympanic membrane revealed a posterior superior perforation. Right modified radical mastoidectomy and tympanoplasty were performed on April 19. He was made more giddy after the

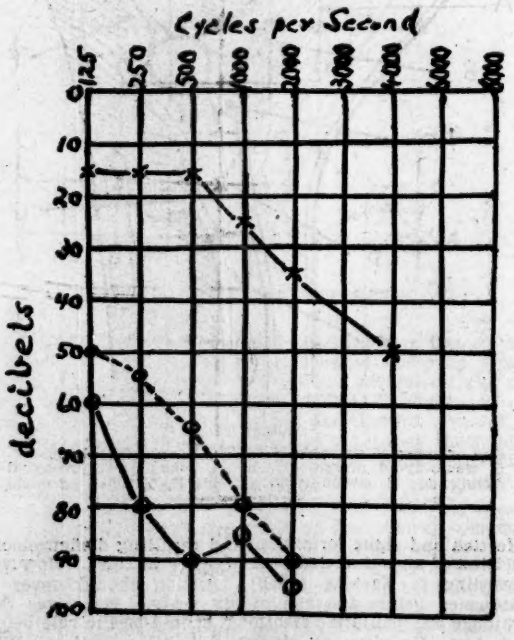

FIGURE I.

Hearing gain in Case I. Solid line, pre-operative level; interrupted line, post-operative level.

operation; but this condition gradually improved and returned to its pre-operative level in about a month. After final removal of the packing the cavity became moist, and a few days later cultural examination of a swab yielded *Pseudomonas pyocyanea*. A perforation appeared posteriorly in the tympanic membrane. This gradually healed, and the discharge cleared after frequent toilets and swabbing of the cavity with 70% ethyl alcohol. Because of the infection and the giddiness he was kept in hospital for five weeks. Twice after he left hospital his ear discharged, and on each occasion the infection was due to *Proteus vulgaris* and responded fairly quickly to topical application of suitable

antibiotics. His ear has been dry for the last six months. His hearing has improved, as is shown by the composite audiogram (Figure I).

CASE II.—A male student, aged thirteen years, had had a left simple mastoidectomy performed in 1952, and the ear had discharged periodically since then. On April 29 a swab from the ear yielded a growth of *Ps. pyocyanea*. On May 17 two sebaceous cysts in the line of the old mastoidectomy scar were removed. On June 29 no pseudomonas was grown on culture. On July 12 left modified radical mastoidectomy and tympanoplasty were performed. At operation the antrum and attic were found to be occupied by cholesteatoma, and the dura was exposed through the *tegmen antri*. The first dressing was done on July 19, when the graft and cavity appeared to be satisfactory. The patient removed the pack during the night of July 21. As the cavity was potentially infected by the time I saw it, it was decided not to repack it. Frequent careful ear toilets and insufflation of 0·75% iodine in boric acid powder were used to dry the cavity. The patient left hospital on September 3 with a clean, dry ear and the graft well taken. He remained in hospital a little longer than usual because he was an inmate of the Reformatory. On October 7 the ear was dry and clean. He was not examined again until August 16, 1956, when the ear was dry and healthy and contained a little cerumen and epithelial debris. His audiogram showed a significant gain in the middle frequencies (Figure II).

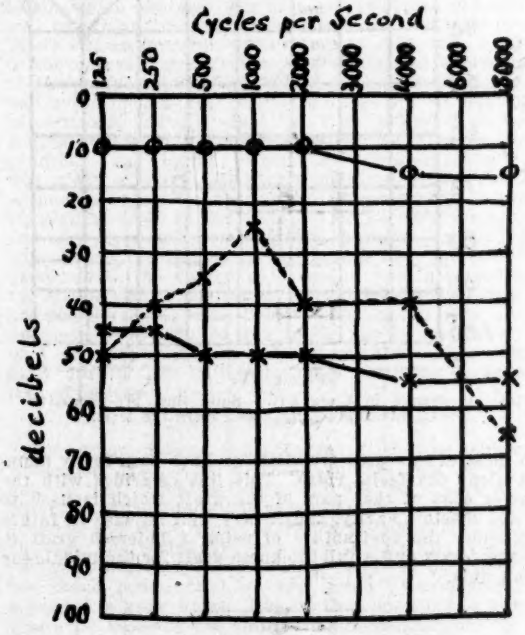

FIGURE II.

Hearing gain in Case II. Solid line, pre-operative level; interrupted line, post-operative level.

CASE III.—A saleswoman, aged thirty years, on July 13, 1955 gave a history of having had a left mastoid operation in Germany in 1944, which was followed by a long series of dressings. For the past three months the ear had been discharging. There was a small central perforation with a polypus showing through it. On July 26 left modified radical mastoidectomy and tympanoplasty were performed. At operation two small pieces of cotton wool, each approximately 0·5 centimetre in diameter, were found in the mastoid antrum. When the packing was finally removed, the cavity was found to be infected with a coagulase-positive staphylococcus, insensitive to penicillin. The discharge responded quickly to the local and parenteral exhibition of "Chloromycetin". This infection recurred some two months later, and again responded to "Chloromycetin". Exuberant granulations have been a trouble in this case, but the ear has now been dry and clean for some months, despite several upper respiratory infections.

Unfortunately it was discovered after the operation that masking was not employed in making the pre-operative audiogram. Therefore it is impossible to draw any conclusions concerning her hearing, which she thinks is about the same as before the operation.

CASE IV.—The patient was a housewife, aged sixty-three years. Her left ear had been growing deaf, and had discharged at intervals since 1938. There was a posterior superior perforation of the left tympanic membrane with some erosion of the neighbouring bone. Left modified radical mastoidectomy and tympanoplasty were performed on September 28, 1955. Convalescence was uneventful, and she left hospital on the twenty-fourth post-operative day. On October 26, 1955, a slit-like perforation was seen posteriorly, but healed in a fortnight. Granulations proved troublesome, and incubation of a swab yielded a coagulase-positive staphylococcus; the infection responded to the topical application of "Chloromycetin". Her ear was dry on January 3, 1956, and has remained dry since then. Although she stated at the time that the hearing had improved in the treated ear, an audiogram on February 29, 1956 showed no change from the pre-operative level. The present level is shown on the composite audiogram (Figure III).

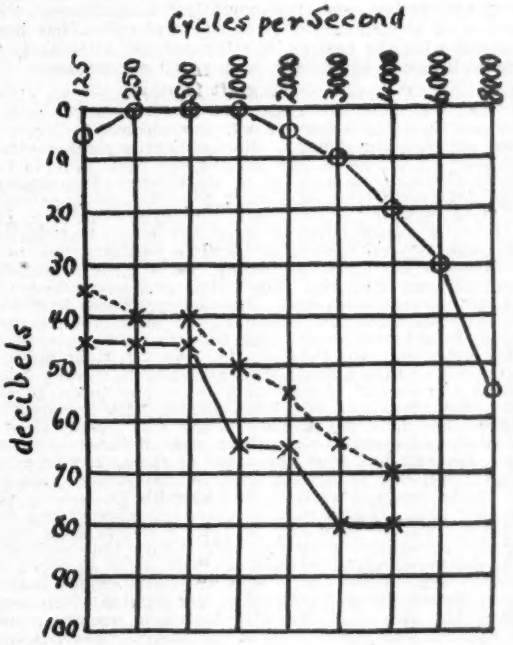

FIGURE III.

Hearing gain in Case IV. Solid line, pre-operative level; interrupted line, post-operative level.

This patient is most enthusiastic about the benefit she has obtained from the operation. She states that she can now converse with people seated on either side of her, whereas before the operation she could not converse with people seated on her left.

CASE V.—A female school-teacher, aged forty-two years, had had a left simple mastoidectomy performed in September, 1943. The ear remained dry until August, 1948. Since then it had discharged at intervals. During 1955 the discharge had been almost continuous. On January 16, 1956, left modified radical mastoidectomy and tympanoplasty were performed. At operation a fistula was found through the mastoid cortex just posterior to the external auditory canal, and the mastoid antrum and the middle ear contained thickened mucosa and mucopus. The immediate post-operative period was uneventful, and she left hospital on the twenty-third day after operation. Continuous supervision of the cavity has not been possible since then, as she lives in the country; but the discharge and exuberant granulations have slowly responded, and on August 10 the cavity was much cleaner and drier. An audiogram taken

on that day showed no significant change from the pre-operative level.

CASE VI.—A housewife, aged twenty-four years, said that her right ear had discharged at intervals since December, 1949. When she was examined in January, 1956, she had a large central perforation, less than the antero-inferior third of the drum being intact. It was agreed that a graft should be attempted. On February 10 right modified radical mastoidectomy and tympanoplasty were performed. She left hospital on the twenty-third post-operative day, when the graft appeared to be intact. A few days later a small central perforation appeared. By March 15, five weeks after operation, the perforation was somewhat elliptical in shape, lying horizontally, and about three millimetres in its longer diameter. Although the ear was dry at that time and has remained so since, the perforation continued to enlarge as the outer epithelium separated from the graft for about a further six weeks. It now forms a typical large central perforation, very much like that seen at the first examination prior to operation. The remains of the graft have taken in the aditus and attic, forming a hood over the upper part of the tympanic cavity, very much like Shrapnell's membrane with the addition of the part attached to the region of the aditus.

As is to be expected, there is no great difference between the pre-operative and post-operative audiograms. The question of attempting to close the perforation has been discussed with the patient, but her present attitude is to leave well alone, as the ear is dry and comfortable.

CASE VII.—A male storekeeper, aged twenty-nine years, said that both ears had discharged at intervals for twelve years up till 1951, when the left ear became dry after a course of penicillin therapy. Since then the right ear had discharged on occasions, and he had had some pain in the mastoid region in the past two or three years. Examination of the right drum revealed a small postero-superior perforation, through which mucopurulent discharge exuded; in the left drum a healed posterior scar was seen. Radiological examination showed both mastoids to be sclerotic. The nose and naso-pharynx appeared healthy. He had had a bilateral radical antrum operation four years previously, and the antrostomies were still patent. The audiogram was irregular, with no pronounced loss except in the high tones. It was decided to operate, as the patient was most anxious to secure a dry ear. On February 14, 1956, the right mastoid was opened, and the antrum was entered by burrowing down between a "forward" lateral sinus and a low dura. In the middle ear there was but little disease, and the ossicles appeared healthy. The mastoid wound was closed, after a tadpole-shaped piece of skin about eight millimetres in its longer diameter had been taken for grafting. A triangular piece of skin was then removed from the postero-superior wall of the external auditory meatus with its base at the tympanic ring. The surface of the drum surrounding the perforation was abraded, and the tadpole-shaped graft fitted over the perforation with its "tail" filling the triangular space previously made on the postero-superior meatal wall. The graft was covered with a layer of gelatin sponge, soaked in penicillin-streptomycin solution, and held in position by packing the meatus firmly with half-inch paraffin gauze. The packing was repeated as in the other operations, and the patient was discharged from hospital on the twenty-second post-operative day, with the graft apparently taken. The ear has remained dry. Although the drum is irregular, it is intact and he has had no further symptoms referable to the mastoid. An audiogram taken on June 6, 1956, four months after operation, showed a more regular graph for the right ear, with decreased loss in the high tones (Figure IV).

CASE VIII.—A housewife, aged thirty years, complained that her left ear had discharged at intervals for fifteen years. When she was first examined on April 20, 1956, there was a moderate amount of mucopurulent discharge coming from a postero-superior perforation of the left tympanic membrane, and granulations extended through the perforation on to the postero-superior wall of the external canal. On June 19 left modified radical mastoidectomy and tympanoplasty were performed. When the antrum was entered between a "forward" lateral sinus and a low dura, cholesteatomatous material was found filling the antrum and extending forward into the attic. Because of a slight left facial paresis, when the wound was repacked little packing was placed in the mastoid cavity, and pressure was exerted only in the middle-ear region. Probably because of this, granulations have proved troublesome in the cavity and along the facial ridge. The graft has taken and is thinning satisfactorily. As it is now only two months since her operation, a follow-up audiogram has not yet been taken.

Results.

It is not possible to draw any statistical conclusions from such a small series of cases; but one gains the impression that we should be able to achieve the aims set out above in the majority of patients subjected to operation. One must not expect the impossible. A graft will not take unless there is a sufficiently large bed from which it can gain blood supply; but it appears that these free, full-thickness grafts will take on to bare bone in an infected cavity if they can get a blood supply.

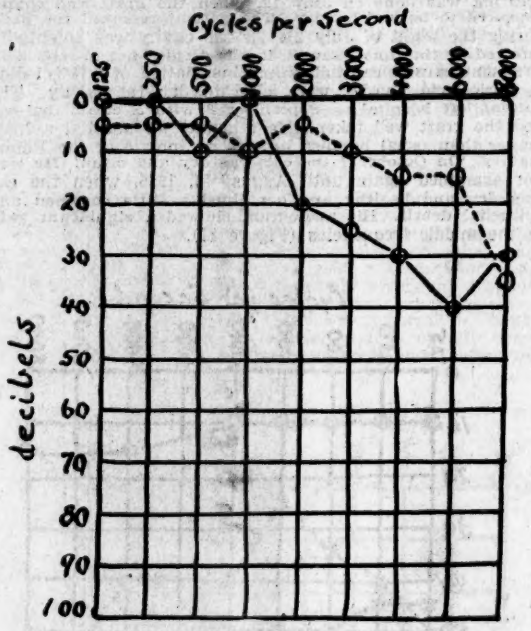

FIGURE IV.

Hearing change in Case VII. Solid line, pre-operative level; interrupted line, post-operative level.

In most of the cases granulations have been fairly abundant along the facial ridge. This line coincides with the anterior edge of that part of the graft which is used to line the mastoid cavity, and it may well be wise in future to consider the advisability of using a Thiersch graft to line the cavity and a full-thickness graft for the middle-ear region only.

Reports of Cases.

ORAL AND PHARYNGEAL LESIONS RARELY SEEN BY THE LARYNGOLOGIST.[1]

By B. B. BLOMFIELD,
Sydney.

IN one of the journals I have read dealing with rare oral and pharyngeal lesions, the author stated that one of the conditions I am about to mention was well known to the dermatologist and to the oculist, but was little known to other practitioners, and he deplored the fact that it was not given more space in general medical text-books.

[1] Read at the annual meeting of the Oto-laryngological Society of Australia (British Medical Association), Adelaide, August, 1956.

My reason for giving this short talk is that, during the last year, I have had two cases referred to me, the like of which I had not previously encountered. The first case was one of pemphigus, and the second one of Stevens-Johnson syndrome. When the patients were first seen, there was a great similarity in their clinical manifestations, which at that stage were confined to the lips, the mucous membranes of the mouth and the pharynx, and in one case to the hypopharynx, the larynx and the conjunctivæ. Both cases were so severe as to be frightening.

Case I.

The case which eventually turned out to be pemphigus I first encountered in August, 1955. There was offensive fungating ulceration of the palate, gums, pharynx, hypopharynx and larynx, with swelling of and bleeding from the tongue; the vermilion surface of the lips was also ulcerated and bleeding; halitosis was extreme. The conjunctivæ were thickened and injected. The patient had been treated elsewhere for some time with various antibiotics, injections of arsenic *et cetera*, but without relief. (I was reminded, at first, of a patient whom I had once seen with an extreme degree of stomatitis which was thought to be due to sucking penicillin lozenges.) The present patient was admitted to hospital, where, on the suggestion of Dr. Bernard Riley, she was given mouth washes of "Benadryl" elixir, which she also was given to swallow, and she was put on gradually increasing doses of histamine-protein. There was an immediate improvement, due more, I suspect, to the natural intermissions and remissions characteristic of pemphigus than to the therapy. However, as the lesions had by no means disappeared, she was put on small doses of cortisone. At this stage Dr. T. G. Millar of Melbourne suggested that the condition might be Stevens-Johnson syndrome and might respond to "Chloromycetin". She was given a course of this, in addition to the cortisone, without any noticeable further improvement. Another suggestion made to me was that of Behcet's disease, and she was given stilbœstrol, which, however, merely caused nausea. As the lesions in the mouth had not completely disappeared, the dosage of cortisone was increased up to 100 milligrammes *per diem*. Two months after I first saw her she developed some flaccid bullæ in the skin, and the diagnosis of pemphigus was made. She is now in the care of a dermatologist, who informs me that she requires a daily dose of 200 milligrammes of cortisone to keep her free of lesions.

Case II.

The other patient came to me from the country in November, 1955, with a mouth so like that of the first patient that, thinking this might also be a case of pemphigus, I immediately had a consultation with Dr. Adrian Johnson and Dr. Cramer. A primary diagnosis of Behcet's disease (aphthosis-oculo-oro-genital syndrome) was made, presumably because there was a suspicion of a lesion on the *glans penis*, and he was given "Terramycin", but appeared to grow worse. He was then admitted to hospital, where he received 200 milligrammes of cortisone in four doses of 50 milligrammes for one day, then 100 milligrammes on the second day, and on the third day one dose of 25 milligrammes; he had saline mouth washes, and the lips were smeared with plain "Vaseline". The oral lesions disappeared after three days. I was told that the fact that there was no lesion on the palate was against the condition being pemphigus. The age of the patient and the recurrences were also in favour of *erythema multiforme exudativum*.

The patient had previously come to me in June, 1955, with a history that in December, 1952, and in October, 1953, he had had "pseudomembranous stomatitis", "the whole mouth and tongue being ulcerated and stuck together". He was in bed at home for six weeks on the first occasion, and in hospital for three weeks on the second occasion. On each occasion he received penicillin. On the second occasion he was told that he had Vincent's angina. He appeared to have an upper respiratory tract infection, but proof puncture of his antra produced a clean result. In June, 1955, his doctor thought he was developing another attack, and gave him four daily doses of penicillin before sending him on to see me. However, on that occasion he did not develop the severe oral lesions. When he came to me in November, 1955, he had bullæ and vesicles on the buccal mucosa and crusts on the vermilion border of the lips, but the roof of the mouth was clear; he had had "cold sores" at the angle of the mouth a few days previously.

True Pemphigus.

The following account of pemphigus is taken from Lever (1953).

The oral mucosa is involved in nearly all patients. The mouth is frequently the site of the "primary" lesion. The oral lesions may precede skin eruptions by twelve months (average, four months). Oral involvement when present is usually severe. The type and appearance of the oral lesions are analogous to those of the skin lesions. Intact bullæ in the mouth are rarely seen; they break soon after formation. As on the skin, bullæ often do not form; the mucosa, like the skin, merely slides off. The resulting denuded areas enlarge by peripheral extension, so that wide areas in the mouth may become involved. Shreds of detached epithelium often are seen at the margins of the denuded areas. These denuded areas are often covered with a whitish exudate, and they bleed easily. Of particular diagnostic significance is the extension of the lesion to the vermilion border of the lips, and often to the adjoining skin. In the severest stage almost the entire oral mucosa may be transformed into one large, denuded area. The lips, gums and tongue usually show considerable swelling. There is increased salivation. The sputum is frequently tinged with blood. Hæmorrhagic crusts form on the vermilion border of the lips. On the vermilion border of the lips there may appear granular vegetations like those seen in the skin in *pemphigus vegetans*. Because of the tenderness of the oral lesions, mastication is difficult and swallowing painful. The lesions may spread to the pharynx and larynx and other mucous membranes (for example, nasal, conjunctival, vulval and anal) may be involved. Like the cutaneous lesions, those of mucous membranes show little tendency to heal; if they heal, they heal without scarring.

Diagnosis and Course.

The persistent appearance of bullæ and erosions in the mouth is highly suggestive either of *pemphigus vulgaris malignus* or of benign mucous membrane pemphigoid. The initial skin lesions are often nondescript and may be diagnosed as impetigo, pyoderma or seborrhœic eczema. Flaccid bullæ eventually appear. Biopsy of bullæ or oozing area reveals acantholysis (Tyanck's test). The stage of generalized eruption varies in length. Occasionally the rapid progress of the disease leads to death within a few weeks, unless corticotropin or cortisone is given. Such fulminating cases are often wrongly diagnosed as instances of *pemphigus acutus* or "butcher's pemphigus". As a rule, several months and occasionally several years elapse before the patient succumbs. Periods of exacerbations and partial remissions are common; complete remissions are rare indeed. The prognosis is thus very grave; there is an occasional survival. Most patients are middle-aged; the disease may occur in old age. Apparently it does not occur in childhood or adolescence. The cause is unknown.

Stevens-Johnson Syndrome.

Other names associated with the Stevens-Johnson syndrome in the literature are *erythema multiforme exudativum* (Hebra), Behcet's disease and Reiter's disease. The syndrome consists of: a skin rash, associated with lesions of the mucous membranes (stomatitis, vaginitis, urethritis), of the eye (conjunctivitis, iritis, keratitis or corneal ulceration, which may lead to total blindness), of the respiratory tract (acute bronchitis, pneumonitis), or of the genitalia (ulceration of the vulva or *glans penis*). The onset is usually abrupt, with considerable systemic disturbance. Untreated, the disease usually runs a course of about three weeks, ending in recovery, though it is occasionally fatal. The condition is commonest below the age of thirty years, but may occur at any age. The lesions in the mouth consist of erythema, with sodden, white thickening of the mucosa, which ulcerates and comes off in strips. The

ulceration in the mouth may precede the skin eruption, and in some recurrent cases the mouth is always more affected than the skin. One author describes the stomatitis as being so severe that there was great difficulty in swallowing, even of fluids; swelling and blistering of the lips and buccal mucosa were present, and there were several sloughing erosions where large vesicles had broken down. In these cases halitosis is very evident.

Summary.

A description is given of two types of lesions in the mouth which are not often seen by the laryngologist.

Both pemphigus and *erythema multiforme exudativum* frequently commence with oral lesions. In the former, in at least some of its forms, the bullæ on the skin may not develop for weeks, months, or even a year. As the diagnosis of pemphigus depends on a condition known as acantholysis, in which there is a disappearance of the intercellular bridges of the epidermis, and which is proved by a cytological test devised by Tyanck, it would appear difficult to make the diagnosis in the absence of skin lesions. However, the chronicity of the condition would lead one to suspect it. Both pemphigus and *erythema multiforme* may occasionally be violently acute and end fatally in a very short time unless treated with ACTH or cortisone. These substances are apparently the only ones of any use in the treatment of pemphigus, and they are being used more and more in the treatment of Stevens-Johnson syndrome.

Reference.

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THREE INTERESTING CONDITIONS.[1]

By V. G. BULTEAU,
Sydney.

NONE of these case reports presents any remarkable method of treatment—in fact, I have to thank a radiologist for the turning of the therapeutic key in one of them; but there are several unusual features about their clinical manifestations.

Adenocarcinoma in Ectopic Salivary Tissue in the Nose.

First, there is a patient who presented with a lump on the left side of her nose (Figure I). For six months she —and her doctor—had watched it. Examination revealed a firm, rubbery, rounded tumour in the lateral nasal wall, equally as visible by anterior rhinoscopy as it was externally. Other than a deflection of the nasal septum to the left there were no other noteworthy features. The blood failed to yield the Wassermann reaction. A biopsy specimen in March, 1956, was reported as showing adenocarcinoma in ectopic salivary tissue.

A day or so later I resected the left lateral nasal wall from the mid-line out, up to and including much of the frontal process of the maxilla and nasal bone. Bridging of the skin edges with tight sutures over the "Vaseline" gauze packing helped to diminish the subsequent size of the cavity. The pathologist declared the excision to be well clear of the tumour. The patient's appearance now is as shown in Figure II, taken three months after operation. A skin graft may be seen laterally. She wears an "Elastoplast" dressing over the cavity, and is to have a forehead flap graft in the near future.

Comment.

Tumours of salivary tissue in sites other than the salivary glands are rare. Lambert (1953) reports 39 cases, the tumours being in the palate (the most common), tongue, larynx, trachea and nose. There is a wide range of structure and behaviour, but one fact is stressed by Lambert: tumours of this type arising in sites other than the salivary glands are more prone to be malignant that those in the glands themselves. His study shows their unpredictable nature. For treatment he favours wide excision and sometimes irradiation, especially in sites unsuitable for surgery. Robbins (1943) refers to the fact that salivary gland

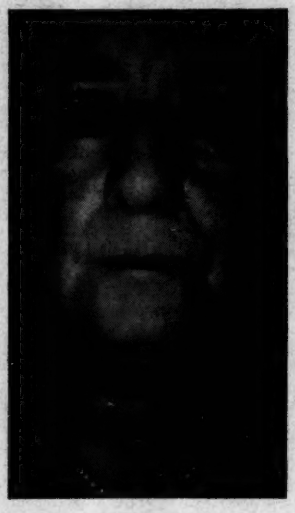

FIGURE I.

tumours outside the large glands are rarely diagnosed correctly. Clinically they seem to be encapsulated cartilaginous tumours. However, they do not cut like cartilage, and the impression of a capsule is created by the fact that it is really the thickened preexistent interlobular septa of the peripheral part of the salivary tissue. Therefore, enucleation, which seems tempting, leaves behind

FIGURE II.

tumour acini at the capsule. Hence the importance of wide excision.

Dermoid Cyst of the Ear.

The second patient was a child, aged almost three years, who presented with a tumour occluding the left external auditory meatus (Figure III). Her mother said that it had

[1] Read at the annual meeting of the Oto-laryngological Society of Australia (British Medical Association), Adelaide, August, 1954.

been present since birth. A probe could be insinuated superiorly and posteriorly, but no view beyond was possible. At operation in July, 1956, the tumour proved to be more extensive, particularly anteriorly, where it had to be removed from the parotid gland. Medially it extended right up to the level of the tympanic membrane. The histological picture was that of a dermoid cyst. Figure IV shows the appearance three weeks after operation.

FIGURE III.

Corkscrew Œsophagus.

The third case is that of an elderly man who came into hospital with the complaint that he had not been able to swallow anything solid for ten days. This is not an unusual history. When it was found that his hæmoglobin value was only 5·3 grammes per 100 cubic centimetres, the portents of malignancy seemed ominous. However, his past and subsequent histories revealed several surprising features. It transpired that he had first begun to have difficulty in swallowing some thirty years earlier. At that time he was a blacksmith, and found that he could quench his thirst well if the beer was warm. However, if it was cold it would not go down. In winter he had to drink hot rum. He thought that an X-ray examination made at that

FIGURE IV.

time evidently must have shown some obstruction, because a doctor had passed an instrument right down into his stomach and advised him to persevere with conservative measures. This he had done during the intervening years, and developed the habit of taking hot tea before meals or warm water with meals, or else holding food in his mouth until saliva accumulated. The next surprise came with fluoroscopic examination with a barium bolus. Cold, the bolus would not go down; but when it was warmed and swallowed it produced an astonishing picture before it eventually went into the stomach. During the long delay in its passage there was rapid and incoordinated peristalsis, in which the lower half of the œsophagus formed narrow ring-like constrictions with areas of dilatation in between. These came and went with startling rapidity, producing a corkscrew pattern. Considerable dilatation and tortuosity of the thoracic aorta were present, deforming the œsophagus but not obstructing it.

Comment.

The factors responsible for corkscrew œsophagus are suggested in a paper in which Lorber and Shay (1955) reported an investigation of patients with dysphagia in whom there was no anatomical obstructive lesion. They came to the conclusions that abnormal œsophageal transport might result from one of two disturbances: cardiospasm, the result of damaged or absent parasympathetic plexuses of the lower part of the œsophagus including the sphincters and/or vestibule; or disorganized motor function of the œsophagus which they suggested might be called dysrhythmia of the œsophagus. They considered that the two varieties might be separated by their respective pharmacological responses to parasympathomimetic and parasympatholytic drugs, and that the response of these drugs not only enabled a differential diagnosis of the type of abnormal œsophageal transport to be made, but also supplied a basis for therapy. In the dysrhythmia group they found irregular and disorganized waves, which were often segmental and which were less effective than the primary peristaltic wave in promoting the propulsive force. The administration of cholinergic drugs of the "Prostigmin", "Urecholine" type, such as are given for *myasthenia gravis*, speeded up the passage, whereas anti-cholinergic drugs such as "Dibuline", "Banthine", "Pamine" *et cetera* produced dysphagia. These patients often had hiatus hernia and/or constriction rings, but no dilatation of the œsophagus. Lorber and Shay's study suggested also that œsophageal regurgitation and peptic œsophagitis might in some cases be connected with the dysrhythmia. As in *myasthenia gravis*, the cause of the dysrhythmia is unknown.

Evaluation of results of treatment is often complicated by the fact that these patients are usually placed on an ulcer-type regime, to say nothing of the effect of emotional factors. This was true of our patient; rest in hospital, blood transfusion and a liberal, warm diet enabled him to leave hospital greatly improved.

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Reviews.

Australian Cooking for the Diabetic and the Overweight. Produced by The Diabetic Association of New South Wales, approved by The Dietetic Association of New South Wales; 1956. Sydney: Australasian Medical Publishing Company Limited. 8¼" × 5½", pp. 72.

PATIENTS who are recommended to eat special diets, such as diabetics and the overweight, often find it difficult to keep within the dietary restrictions and yet have tasty and acceptable meals. The little book produced by The Diabetic Association of New South Wales entitled "Australian Cooking for the Diabetic and the Overweight" could make the lot of such patients much more comfortable. The book contains only 64 pages, but the recipes given are simple to prepare and should be tasty.

"Diet Hints for Diabetics" by the New South Wales Department of Public Health is reproduced as an introduction to the recipes. A short article by Dr. Joan Woodhill on "Diabetes and Overweight" follows, and then there are recipes for a very wide variety of dishes. The recipes are set out very clearly, and each has a short statement of what the dish can be used as a substitution for—*e.g.*, macaroni cheese and tomato is a substitution for one ounce of bread, two ounces of milk and one ounce of meat. Some very good rules are given for the preparation of salads. Much credit should be given to Mrs. Venn-Brown for the care in the selection of suitable recipes. The little book can be thoroughly recommended, not only for diabetics and the overweight, but for anyone desiring a simple cook book, minor modifications being necessary, of course, for normal people.

Atlas of Tumors of the Nervous System. By H. M. Zimmerman, M.D., Martin G. Netsky, M.D., and Leo M. Davidoff, M.D.; 1956. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 10½" × 7½", pp. 192, with 277 illustrations, 233 in colour. Price: £13 15s.

A SUCCESSFUL ATLAS must present both the characteristic features of common conditions for the tyro, and clear expositions of rarities which the expert may use to help in

identifying unusual lesions. Unfortunately, the book under review does not satisfy either of these demands. Most of the figures are in colour, but either the colour does not truly represent the photomicrographs from which they were taken, or else the staining in the original slides was of poor standard. Figure 15, for example, which purports to represent a piloid astrocytoma stained by hæmatoxylin and eosin, has the tints of a faded Van Gieson stain, and the lesion is unidentifiable. This example was selected at random. While some pages contain illustrations which reach satisfactory levels, the general standard is poor. This book is very expensive; but even if it was cheap, it could not be recommended. No useful purpose can be served in giving detailed descriptions of its defects; it suffices to say that these far outweigh anything of merit.

The Year Book of Radiology (1956-1957 Year Book Series). Radiologic Diagnosis, edited by John Floyd Holt, M.D., and Fred Jenner Hodges, M.D.; Radiation Therapy, edited by Harold W. Jacox, M.D., and Morton M. Kligerman, M.D.; 1957. Chicago: The Year Book Publishers, Incorporated. 9" × 6", pp. 430, with many illustrations. Price:

THIS book is a review of the world's literature on radiological matters from June, 1955, to June, 1956. The regional arrangement of subjects allows of ready reference. There is an introduction entitled "The Debt of Surgery to Roentgenology", by Frederick A. Coller. Reports show that image intensification is being improved, and it is considered that the cinefluorographic approach, with an image intensifier tube, shows most promise. It allows of a 13 centimetre image and of viewing in ordinary room lighting, while radiation of patient and operator is reduced to a minimum. In cases in which opaque media are used, a "Sodium Hypaque" solution is coming into use, especially in cerebroangiography, as it causes no untoward effects. Several cases of cord pressure have occurred after excessive amounts of fluoride absorption. Several cases of posterior dislocation of the shoulder are reported. These are missed at times with ordinary antero-posterior films, but should be discovered by clinical examination. Cardiac and aortic lesions still receive much attention, and many interesting cases are recorded. A new lung condition called silo-filler's disease is reported; it is due to exposure to the fumes of nitrogen dioxide released from silage when it is being cut. The films resemble silicosis, and the condition is characterized by acute bronchitic symptoms. A water-soluble solution, such as "Hypaque" or "Urokon", has been used with success in gastro-intestinal work, instead of the usual barium suspensions; such a solution is non-irritant and non-toxic. Two cases of extensive hæmangioma of the rectum are reported from Stockholm (Hellstrom). Very little new work is reported in urology or gynæcology. Radiation therapy continues to advance along sound lines, and much work is being done by high radiation, moving field therapy and isotopes. Good results have been reported in the treatment of mixed parotid tumours after enucleation of the growth. The recurrence rate is still high, and recurrences take place within a year. Radiation treatment of many eye tumours, *e.g.*, melanoma and retinoblastoma, has shown encouraging results. The treatment of lung cancer has been disappointing. Irradiation of prostatic cancer has given better results. A 90% cure is looked for in lip cancer after radiation therapy. The cobalt unit is being more widely used. Dosages and methods of application are given in detail. This Year Book is a habit; it is moderately interesting, but will leave no lasting impressions.

The Head and Neck in Roentgen Diagnosis. By Eugene P. Pendergrass, M.D., J. Parsons Schaeffer, M.D., Ph.D., and Philip J. Hodes, M.D.; Volumes I and II; Second Edition; 1957. Oxford: Blackwell Scientific Publications. 10" × 6¾", pp. 1996, with 1740 illustrations. Price: £14.

THIS is a huge work comprising two volumes; the pages are numbered through both volumes, and a complete index is appended to each volume—a very handy and easy method for reference. About 150 pages are devoted to the anatomy, growth and anomalies of the skull and to the meninges. A similar arrangement is also included in the consideration of the neck and its structures. There follows a wide description of fractures of the cranial and facial bones. The illustrations and captions are of excellent quality.

The authors point out that a negative finding does not exclude brain injury or even fracture. It is noted that skull fractures heal rapidly, but evidence of such a fracture may be visible for more than a year. The technique of examination of the mandibular articulation is clearly described. The methods necessary to demonstrate the various lesions are sufficient to allow clear films to be taken of all regions of the skull. Bone diseases of the skull are described, and it is noted that early osteomyelitis is difficult to detect. Many rare diseases are dealt with, including actinomycosis, yaws and syphilis. Osteopetrosis and melorheostosis produce changes in the skull. Changes in anæmia, Paget's disease and hyperparathyroidism are described. Tumours of the brain and methods of cerebro-angiography are fully dealt with, and the various projections necessary to display lesions are well illustrated. The section on examination of the mastoid and petrosal bones should prove most helpful. Dental radiography is included in the work. The technique for localization of foreign bodies in the eye is complete; Sweet's improved localizer is in use in the larger hospitals, and is subject to only small error.

The section on the neck is exhaustive. Soft tissue lesions can be demonstrated by suitable technique, while the bony structures also can be suitably demonstrated by painstaking technique. A good method of obtaining good films of the lower cervical segment is described. The patient sits down with the arms drawn well forward, and the central rays are projected through the axilla furthest from the film.

Many interesting conditions are described and well illustrated. At the end of each section of the book a complete bibliography is given.

Altogether the work is most complete, and should remain in the forefront of radiological literature for many years to come. It can be recommended to all radiologists and should also be of great help to neurosurgeons.

The Natural Development of the Child: A Guide for Parents, Teachers, Students and Others. By Agatha H. Bowley, Ph.D., F.B.Psy.S., with a foreword by D. R. MacCalman, M.D.; Fourth Edition; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 7½" × 4¾", pp. 224, with 84 photographs. Price: 10s. 6d.

THE fourth edition of "The Natural Development of the Child", by Dr. Agatha Bowley, has brought this sound and practical work up to date. Since it was first published in 1942, Dr. Bowley has been one of a number of workers in the field of child development who have been conscious that, while much valuable work has come forward concerning the physical and psychological growth of the child, too little attention has been given to the characteristics of moral development, and to the conditions necessary to facilitate growth towards spiritual maturity. It is therefore natural that in this study of growth and development from infancy to adolescence, the interrelation of physical, mental and spiritual factors should be emphasized.

Dr. Bowley's discussion of the difficulties characteristic of each stage of growth is based on experience, sympathetic understanding and sound principle, and is of value to parents and to professional workers alike. Studies in the effects of separation of small children from their mothers, which began as a result of wartime experience, have done much to emphasize the importance of the mother-child relationship and the special difficulties of deprived children. Although these questions are not fully examined in the present volume, the suggestions for further reading give a good guide to wider study.

Pulmonary Emphysema. Edited by Alvan L. Barach, M.D., and Hylan A. Bickerman, M.D.; 1956. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9¼" × 6¼", pp. 555, with illustrations and tables. Price: £5 10s.

THIS volume is presented by a number of contributors who are authorities on various aspects of the subject, and consequently the volume is a comprehensive presentation of the problems and management of emphysema.

This book might better have perhaps been entitled "The Physiology and Management of Pulmonary Emphysema", because, like so many modern medical texts, there is an almost complete absence of references to the basic structural changes in the disease. This appears to be due, at least in part, to a persistence of that shibboleth that it is function that matters and not structure. That the importance of function should have been emphasized at the turn of the century was most necessary, but that we should now continue to struggle with problems of function without appreciating the structure of the tissues whose functions we are investigating is absurd. This is a general problem; but in the case of the lungs it appears to be also a matter of ignorance—a feature which should in itself provide a stimulus for those interested in the elucidation of the innumerable problems. However justified this particular

criticism may be, in the present volume there is a tremendous amount of information which will be of the greatest value to those interested in its problems. The questions dealt with in the various chapters range from a consideration of pathogenesis (in which psychological problems and ultra-modern psychiatry are not overlooked), through various aspects of physiology and pharmacology up to various aspects of management of the disease.

There is an excellent account of the mechanics of breathing, and considerable space is given to the general disturbances, such as acidosis, which are the direct result of the condition. The importance of infection is emphasized, both from the point of view of its significance in the development of the condition, and also from the point of view of its control. A valuable account is given of the circulatory changes which occur in the cardio-vascular system in chronic pulmonary emphysema, and in this is accumulated, as in many of the other chapters, a considerable amount of information from the literature. The chapter on the surgical procedures which may be adopted in pulmonary emphysema is a useful summary of the subject, although it is incomplete without reference to the question of removal, in appropriate cases, of the peripheral cortical part of the lung, which is sometimes most obviously involved.

Altogether, this work should be found to be most useful. The chapters must be considered independently; they are not placed in the order which might be expected, and similar ones are not placed near each other. Nevertheless, they can be easily found by reference to the table of contents or to the index. In addition to the very good presentation of the observations and opinions of the author in each case, there is also an excellent bibliography, which is divided into sections, and the appropriate portions are placed at the end of some of the chapters.

The general presentation of the volume is of typical modern standard. The text is clear and the illustrations are of a high order of excellence. The röntgenograms are specially well produced and show clearly the various features discussed. There are numerous simple but excellent diagrams. The index is adequate. Altogether this book can be recommended to physicians and students who are interested in the condition, and particularly to those who wish to be brought abreast of recent work on the physiology and treatment of pulmonary emphysema.

X-Ray Reports: Their Importance in a Diagnostic Department: A Manual for Radiographers and Clerks. By G. Lieba Buckley, M.A. (Cantab.), M.B., B.S. (London), D.M.R.E. (Camb.); 1957. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 79, with four illustrations. Price: 7s. 6d.

THIS book gives one the impression that in justification of publication it is directed at radiographers and clerks, when it is a manual mainly to assist clerks only; on a number of occasions the advice is given, "when in doubt ask the radiographer", even to checking reports. As a guide to clerks in X-ray departments it should prove useful, particularly the glossary. However, a number of words in the glossary would never be used by the radiographer, or even understood, and there are errors in spelling.

It has long been recognized that a manual for radiographers is necessary, but the size and scope are a problem. Several books on techniques include many sections for the radiographer. A combined book for radiographers and clerks is not advisable, because their work is very different. In a private practice, however, there may be combined duties of clerk and radiographer.

Clinical Examinations in Neurology. By James A. Bastron, M.D., Reginald G. Bickford, M.B., Joe R. Brown, M.D., Edward G. Clark, M.D., Kendall B. Corbin, M.D., David D. Daly, M.D., Lee M. Eaton, M.D., Norman P. Goldstein, M.D., Edward H. Lambert, M.D., Clark H. Millikan, M.D., Donald W. Mulder, M.D., Harry L. Parker, M.D., E. Douglas Rooke, M.D., Joseph G. Rushton, M.D., Robert G. Siekert, M.D., and Jack P. Whisnant, M.D.; 1956. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 9½" x 6½", pp. 388, with 70 figures. Price: £3 15s.

SIXTEEN authors have contributed to this book, which is designed to guide post-graduate students in the mastery of the clinical neurological examination. It achieves this purpose admirably by a concise and accurate text supplemented by excellent illustrations.

As a sound knowledge of the anatomy and function of the nervous system is essential for an understanding of every aspect of clinical neurology, the authors wisely review in each chapter the relevant basic anatomical and physiological facts. The majority of common nervous diseases are briefly discussed throughout the text, to illustrate some particular facet of the neurological examination, and to teach the student how to utilize the information gained from his tests to arrive at a diagnosis. The importance of history-taking is stressed, and there are excellent chapters on neuro-ophthalmology, testing of specific muscles, and the study of disturbances of language and higher mental functions. Discussions on electroencephalography, electromyography, and biochemical and pharmacological aids to diagnosis are included, presenting mainly an approach to the understanding and scope of these investigations without involving the student in cumbersome detail. A similar brief chapter on the indications and scope of special neuro-radiological techniques might perhaps be included in future editions, to make this readable book the complete guide to a clinical approach for both post-graduate and advanced undergraduate students in neurology.

Blood Transfusion in Clinical Medicine. By P. L. Mollison, M.D., M.R.C.P., with a foreword by Sir Alan N. Drury, C.B.E., F.R.S.; Second Edition; 1956. Oxford: Blackwell Scientific Publications. 9" x 5½", pp. 614, with illustrations and tables. Price: 45s.

THE first edition of Mollison's book was published five years ago, and has been regarded by most workers in the field as the standard reference book on blood transfusion. The second edition is a better, more lucid and more complete book. It has been largely rewritten and considerably enlarged, to include the surprising number of advances which have occurred since the original publication. By his own virile and active research the author has contributed to many of the newer discoveries, and the second edition, like the first, portrays his enthusiastic approach to problems associated with blood transfusion. At the same time, the contributions of others are presented with commendable impartiality. The book is more than a reference book on blood transfusion, because it contains details of the pathogenesis and pathology of many clinical conditions in which blood transfusion is used for therapy, and in which the author has been particularly interested. It will, therefore, be invaluable to the hæmatologist as well as to the transfusion specialist.

Major additions include the newer chemical and physical approaches to red-cell preservation, a more complete account of methods for measuring red-cell survival in patients and a lucid description of the blood group systems including those recently discovered. In the foreword, Mollison states that: "In blood grouping, the pace of discovery has at last become slower and it seems doubtful whether any new major human blood group systems remain to be found." This thought will be welcomed by those who are concerned with the transfusion of patients and the provision of compatible blood, but may be regretted by geneticists looking to the blood groups to assist in solving problems of human inheritance.

It is a pity that the size of the book should have been increased in the rewriting. This is probably inevitable in a rapidly developing field, but it makes the book more suitable as a reference book than as a practical bench manual. Nevertheless, the second edition is the most important reference available on blood transfusion, and must find a prominent place in every hospital laboratory and in every medical library. It is as modern as it is comprehensive.

The Human Machine. By Adolphe Abrahams; 1956. Victoria: Penguin Books Proprietary, Limited. 7" x 4¼", pp. 200. Price: 5s. 6d.

SIR ADOLPHE ABRAHAMS has for long been accepted as an authority on the physiology of muscular exercise, and the appearance of a "Pelican Book" of 200 pages by him called "The Human Machine" is a matter of some note.

The first fifty pages of the book are on the human and mechanical machine, and point out the likeness and differences between the actions of the human body and those of a mechanical machine. This is very well done for those who like this sort of thing; but a straight-forward account of the physiology of muscular action and of concomitant activities would probably be more acceptable to the intelligent reader. Much of the rest of the book treats of exercise and its physiology clearly and thoroughly. Training for athletic events is dealt with in considerable detail, obsolete fetishes are condemned, as also is the use

of drugs, and a clear account is given of modern training methods and the reasons for their acceptance. Injuries and real or supposed disabilities are discussed fully. About thirty pages are taken up with accounts of records in many sports, past, present and future. Finally there is some common-sense discussion on fitness and endurance.

The book is a balanced account of all aspects of physical exercise, and should be read by all persons in charge of the training for sport of boys and girls. It could, too, be read with interest and advantage by the boys and girls and by their parents.

The Queen Charlotte's Text-Book of Obstetrics. By G. F. Gibberd, M.B., M.S., F.R.C.S., F.R.C.O.G., W. R. Winterton, M.B., F.R.C.S., F.R.C.O.G., H. G. E. Arthure, M.D., F.R.C.S., F.R.C.O.G., Briant Evans, M.B., B.Ch., F.R.C.S., F.R.C.O.G., Kathleen M. Robinson, M.D., F.R.C.S., F.R.C.O.G., S. G. Clayton, M.D., M.S., F.R.C.S., F.R.C.O.G., T. L. T. Lewis, M.B., B.Ch., F.R.C.S., M.R.C.O.G., J. S. Tomkinson, M.B., F.R.C.S., M.R.C.O.G., and Charles D. Read, M.B., Ch.B., F.R.C.S., F.R.A.C.S., P.R.C.O.G., Thomas Hunt, D.M., F.R.C.P., A. White Franklin, M.B., B.Ch., F.R.C.P., E. Rohan Williams, M.D., F.R.C.P., F.F.R., D.M.R.E., J. Murray, M.D., G. W. B. James, C.B.E., M.C., M.D., D.P.M., and Geoffrey C. Steel, M.R.C.S., L.R.C.P., F.F.A.R.C.S.; Ninth Edition; 1956. London: J. and A. Churchill, Limited. 9¼" × 6¼", pp. 559, with four coloured plates and 246 text figures. Price: 45s.

THE ninth edition of "The Queen Charlotte's Text-Book of Obstetrics" has been produced four years after its predecessor. In general, it is very similar to previous editions, but all treatment has been brought up to date (for example, the latest antibiotics used in puerperal fever are mentioned). The ideas of the new members of the staff are reflected in the work.

Australian readers will be interested in two points: first, the fact that ante-natal exercises and "relaxation classes" are no longer considered to be of value; second, that Hamlin's claims that preeclampsia and eclampsia are preventible are not substantiated by the Queen Charlotte's Hospital staff.

A concise chapter on post-maturity gives views with which many people would agree, that labour should be induced when the pregnancy is more than two weeks overdue, after an accurate assessment of dates has been made. No nipple treatment is advocated during pregnancy, and sodium bicarbonate is still recommended as of use in the treatment of dyspepsia.

In the care of the baby, the routine excludes eye treatment and bathing. There is a good section on the premature baby, including a discussion on the prevention of kernicterus by exchange transfusion.

In other respects the book follows the pattern of its predecessors, and attempts to "strike a balance between the need for full descriptions of common minor disorders and adequate accounts of rare and serious conditions". It can again be recommended to students and practitioners.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Physiopathology of the Reticulo-Endothelial System: A Symposium Organized by the Council for International Organizations of Medical Sciences: Established under the Joint Auspices of UNESCO and W.H.O.", edited under the direction of B. N. Halpern by B. Benacerraf and J. F. Delafresnaye, C.I.O.M.S.; 1957. Oxford: Blackwell Scientific Publications. 8½" × 5½", pp. 330, with many illustrations. Price: 45s.

Contains 17 papers with the following discussion in each case.

"The Surgical Clinics of North America: April, 1957. New York Number: Modern Management in Obstetrics and Gynecology", edited by R. Gordon Douglas, M.D.; 1957. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 8½" × 5½", pp. 309, with 213 illustrations. Price: Cloth binding, £8 2s. 6d.; paper binding, £6 15s.

Contains 21 articles by qualified authors from "as many representative New York Institutions as possible".

"Dextran: And Its Use in Colloidal Infusion Solutions", by Anders Grönwall, M.D.; 1957. Stockholm: Almqvist and Wiksell. New York: Academic Press, Incorporated. Oxford: Blackwell Scientific Publications. 8½" × 5½", pp. 156, with 28 illustrations. Price: 20s.

Sets out the work that has been done up to date on dextran from both the laboratory and the clinical points of view.

"Recent Advances in Anæsthesia and Analgesia (Including Oxygen Therapy)", by C. Langton Hewer, M.B., B.S. (Lond.), M.R.C.P. (Lond.), F.F.A.R.C.S. (Eng.), and J. Alfred Lee, M.R.C.S., L.R.C.P., M.M.S.A., F.F.A.R.C.S. (Eng.); Eighth Edition; 1957. London: J. and A. Churchill, Limited. 8" × 5¼", pp. 304, with 95 illustrations. Price: 40s.

The system of presentation has been altered in this edition, so that recent developments are presented without any description of previous knowledge of the subject.

"Principles of Urology: An Introductory Textbook to the Diseases of the Urogenital Tract", by Meredith F. Campbell, M.S., M.D., F.A.C.S.; 1957. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 10" × 6¾", pp. 646, with 319 figures. Price: 95s.

Intended for the instruction of the student in the broad fundamentals of urology and to serve as a practical guide for the doctor who is not a urological specialist.

"Clinical Neurosurgery: Proceedings of the Congress of Neurological Surgeons, Los Angeles, California, 1955"; 1957. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 6", pp. 276, with 130 illustrations. Price: £5 10s.

Contains three chapters by Dr. Carl W. Rand and three symposia.

"The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics: For the Use of General Practitioners, Pediatricians, Interns and Medical Students", by Wilburt C. Davison, M.A., D.Sc., LL.D., M.D., and Jeana Davison Levinthal, B.A., M.D.; 1957. Durham: N. C. Seeman Printery for Duke University Press. 9¾" × 6". Price: $4.25.

Prepared for the use of general practitioners, pædiatricians, hospital resident medical officers and medical students.

"Clinical Use of Radioisotopes: A Manual of Technique", edited by Theodore Fields, M.S., F.A.C.R. (Assoc.), and Lindon Seed, M.D.; 1957. Chicago: The Year Book Publishers, Inc. 7½" × 5", pp. 456, with 71 illustrations.

A "manual for practical application" with 17 experienced contributors.

"The Year Book of Urology (1956-1957 Year Book Series)", edited by William Wallace Scott, M.D., Ph.D.; 1957. Chicago: The Year Book Publishers, Incorporated. 7½" × 5", pp. 384, with 87 illustrations. Price: $6.75.

One of the Practical Medicine Series of Year Books.

"1957 Medical Progress: A Review of Medical Advances during 1956", edited by Morris Fishbein, M.D.; 1957. New York, Toronto, London: McGraw-Hill Book Company, Incorporated. 9" × 6", pp. 382. Price: $6.00.

An annual review.

"Methods of Biochemical Analysis", edited by David Glick; Volume IV; 1957. New York and London: Interscience Publishers, Incorporated. 9" × 6", pp. 372, with nine illustrations. Price: $8.50.

An annual review.

"*Röntgendiagnostik: Ergebnisse* 1952-1956", edited by H. R. Schinz, R. Glauner and E. Uehlinger; 1957. Stuttgart: Georg Thieme Verlag. 10½" × 7½", pp. 604, with 545 illustrations. Price: DM 139.

The text of this book on X-ray diagnosis is entirely in German.

"Coronary Heart Disease: Angina Pectoris; Myocardial Infarction", by Milton Plotz, M.D., F.A.C.P.; 1957. New York: Paul B. Hoeber, Incorporated. 10" × 7", pp. 368, with 107 illustrations. Price: $12.00.

Addressed to both general practitioners and specialists.

The Medical Journal of Australia

SATURDAY, JULY 13, 1957.

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AUSTRALIAN MEDICAL HISTORY OF THE WAR: A THIRD VOLUME.

> To live is to achieve a perpetual triumph; it is to assert oneself against destruction, against sickness, against the annulling and dispersion of one's physical and moral being.

THESE words, written by Henri Frédéric Amiel, are used by Dr. Allan S. Walker as a prologue or motto to the third volume of his group of four books which comprise "Series 5 (Medical)" of the official history of the war, entitled "Australia in the War of 1939-1945", and published under the general editorship of Gavin Long. The present volume is "The Island Campaigns".[1] The first of the medical volumes dealt with the clinical problems of war and was reviewed in this journal on December 13, 1952; the second, devoted to the part played by Australian medicine in the Middle East and the Far East, was reviewed on September 19, 1953. This third volume deals with happenings much nearer home—in fact one chapter is entitled "In Australia, 1943-45". The author explains in his preface that in the second volume the story swept on past New Guinea, the Solomons and other islands and followed the fate of the prisoners of war scattered over the eastern zones of conflict. Reference to our review of the second volume will show how completely Dr. Walker covered the campaigns in northern Africa, Greece and Syria, the return of the First Australian Corps to Australia, the Malayan campaign and the heroic endurance of 15,000 Australians who became prisoners of war. It will be seen that the third volume must consist of a series of chapters dealing with separate campaigns, each of which is more or less complete in itself. At the same time, since each is part of one enormous undertaking, this must be clear in the telling of the narrative. It is here that Dr. Walker shows his skill—in dealing with a part he never loses sight of the whole, and he is a good story-teller. Here is much detail of units, of their commanders and of the men who did the actual work. Incidentally, this fact will be most likely to promote sale of the volume, for almost everyone likes to see his actions described in cold print, deny it though he may.

The book opens with the statement that December, 1941, was the most fateful month for Australia since the outbreak of war in September, 1939. The threat of war came close to Australia, but the danger had been foreseen and certain steps had been taken. Major-General R. M. Downes, as Director-General of Medical Services, approached Dr. E. T. Brennan, Senior Medical Officer in the Rabaul Civil Administration, for cooperation in the care of men who might need hospital treatment. Brennan's help was freely given, and his "extensive tropical experience was of great value". The important principle was established that Australia would need a safe tropical base in the event of war in the islands. Further, no base could be regarded as safe without the control of endemic diseases, the most important of which was malaria. Port Moresby was in the tropics, but it was in a dry area. It was healthy as a result of the "earnest application of preventive measures"; it had a good harbour and was close to the Australian mainland. Moresby did become the military base and has grown in importance since then. One other point referred to in the first chapter should be mentioned; it concerns the general military situation more perhaps than the medical arrangements. It has to do with divided control in the defence programme, and refers to the Volunteer Defence Corps, of which Lieutenant-General Sir Iven Mackay was given command. Dr. Walker points out that Mackay found the extent of his authority and command restricted. Elaborate planning took place, but "only small defence forces could be spared to send to the islands ringing Australia on the north and east". "However, it was evident that the defenders of Australia would be fighting in the tropics, and responsible officers of the medical services were well aware that persistent endeavours would be needed to prevent the forces of nature from dangerously thinning the ranks of the fighting men." General medical organization was furthered by bringing all the medical affairs of the Eighth Military District under the control of the army. Shortly after this the general administration of the Territory of New Guinea and of Papua was simplified by the suspension of the civil administration of both territories and the substitution of military control. As a corollary the Australian New Guinea Administrative Unit ("Angau") was formed. Its functions were "to carry out the civil administration of Papua, and to assist the commander in operating against the enemy by the use of the special knowledge and experience possessed by their members".

The Owen Stanley Campaign, across the Kokoda Trail, probably stands with the Gallipoli Campaign of World

[1] "Australia in the War of 1939-1945." Series 5, Medical. Volume 3: "The Island Campaigns", by Allan S. Walker, M.D., Ch.M., F.R.A.C.P.; 1957. Canberra: Australian War Memorial. Obtainable at all booksellers. 9½" × 6", pp. 444, with many illustrations. Price: 35s.

War I as one of the most magnificent military events of the latter days. It was in June, 1942, that the Papuan Infantry Battalion and the 39th Australian Infantry Battalion were charged with "the task of preventing any movement of the Japanese across the Owen Stanley Range through the Kokoda Gap". How this was done is a story of advance, retreat and advance again. The country was most difficult and most beautiful. Dr. Walker quotes a description from a report by Colonel F. Kingsley Norris which will well bear reproduction. Norris himself quoted it in this journal in December, 1945, in an article on the New Guinea Campaign. He wrote:

> There was but one axis of withdrawal—a mountain track which defies adequate description. Before the campaign, this route had been considered passable only to natives or trained district officers. Imagine an area of approximately 100 miles long—crumple and fold this into a series of ridges, each rising higher and higher until 7,000 feet is reached, then declining in ridges to 3,000 feet—cover this thickly with jungle, short trees and tall trees tangled with great entwining savage vines—through the oppression of this density cut a little native track two to three feet wide, up the ridges, over the spurs, around gorges and down across swiftly flowing happy mountain streams. Where the track clambers up the mountain sides, cut steps—big steps, little steps, steep steps—or clear the soil from the tree roots. Every few miles bring the track through a small patch of sunlit kunai grass, or an old deserted native garden, and every seven or ten miles build a group of dilapidated grass huts—as staging shelters—generally set in a foul offensive clearing. Every now and then leave beside the track dumps of discarded putrefying food, occasional dead bodies, and human foulings. In the morning flicker the sunlight through the tall trees, flutter green and blue and purple and white butterflies lazily through the air, and hide birds of deep throated song or harsh cockatoos in the foliage. About midday and through the night, pour water over the forest, so that the steps become broken and a continual yellow stream flows downwards, and the few level areas become pools and puddles of putrid black mud. In the high ridges about Myola, drip this water day and night over the track through a fœtid forest grotesque with moss and glowing phosphorescent fungi.

Readers are advised to read Dr. Walker's account carefully; they will find it much easier to follow if they keep the map before them. It is impossible to imagine more difficult conditions for the evacuation of wounded. At least eight bearers were needed for each stretcher case. The work of the native carriers is described by Kingsley Norris and quoted as follows:

> With improvised stretchers—one or two blankets lashed with native string to two long poles spread by stout traverse bars—as many as eight or ten native bearers would carry day after day. To watch them descend steep slippery spurs into a mountain stream, along the bed and up the steep ascent, was an object lesson in stretcher bearing. They carry stretchers over seemingly impassable barriers, with the patient reasonably comfortable. The care which they show to the patient is magnificent. Every need which they can fulfil is tended. If night finds the stretcher still on the track, they will find a level spot and build a shelter over the patient. They will make him as comfortable as possible, fetch him water and feed him if food is available—regardless of their own needs. They sleep four each side of the stretcher, and if the patient moves or requires any attention during the night, this is given instantly.

At this stage mention must be made of "the outstanding influence and work" of Captain G. H. Vernon. Vernon graduated in medicine at Sydney more than fifty years ago, and eventually found his way to New Guinea. At the time of the Kokoda Trail episode he had "outrun by age his term as a government medical officer". He left a rubber plantation to offer his services to the army and was able to rejoin the forces to work with Angau, in spite of being obviously much over age. He found that many native carriers then being used were sick and in poor physical condition. He was sent to form a medical base and hospital for carriers. His sphere of work extended over the whole line to Kokoda, "and this gaunt old man ranged up and down the track with an activity that disarmed men half his age". We are told that he "understood the natives, regulated their loads, which were standardised at 40 pounds (previously 50 pounds or more), secured them adequate rest and rations, refused to let them work if truly unable, though he often sent tired men out on essential tasks, and looked after them when sick". A great deal of detail might be given of the medical work carried out on the ranges in this campaign, but the temptation must be resisted. Suffice it to state that of the 750 casualties successfully transported to the base area only four subsequently died in hospital. There is an important chapter on "Events at Moresby", and here it is stated that malaria prevention was hampered by lack of material; this will be mentioned in connexion with the next chapter, which deals with Milne Bay.

Milne Bay was of such strategic importance that it was decided not to allow it to pass into the hands of the Japanese. It was, however, by no means an easy area to occupy. The military area of the bay was roughly twenty miles long and eight to ten miles wide. The land area was low swampy jungle, ten miles by three, ringed by mountains on three sides and by the sea on the fourth. The flat part of the land area was low-lying; none of it was more than 20 to 100 feet above sea level. The many streams and small creeks running from the mountains to the sea became "fast and deep torrents" after heavy rain. It is perhaps possible to imagine the state of affairs when some thousands of men had landed and the rain did come. For example, a casualty clearing station (110th) which was excellently equipped arrived. The unit went to a staging camp. Ten inches of rain fell while the ships carrying the stores were being unloaded. Many stores were dumped in the mud and ruined. "No carton packings, even with the protection of boxes, could withstand the weather." Equipment was not always readily available. After the Japanese landed and attacked, the surgeons of one casualty clearing station, we read, had to cope with considerable difficulties. "Sufficient instruments, anæsthetics, and dressings, had to be found in the packed cases, which bore no external indications of their contents." "It was only a happy discovery of trucks bearing the unit's colours on a siding near Brisbane some time previously that enabled the C.C.S. to act as a surgical unit." The malarial hazard at Milne Bay was known to be great; pre-war surveys had shown malignant tertian malaria to be endemic. The commander of the field ambulance which covered the brigade proceeding to Milne Bay had taken the opportunity to train his unit in preventive methods at Townsville. The commander of the brigade found on his arrival at Milne Bay that the general standard of hygiene in the brigade was poor and that practically no personal precautions were being taken by the men. Quinine was the suppressive drug used, but administration did not begin till the brigade had been a week in Milne Bay, and for a time supplies were inadequate. An instruction by the commander of the field

ambulance was used as a model by the advance party of the field ambulance. A little later it was promulgated as a brigade instruction. In this stress was laid on the personal suppressive use of quinine in daily doses of ten grains, on the wearing of protective clothing, and on the methods of adult and larval mosquito control. "However, there were no nets available for use when the force arrived and very little protective clothing: the men wore shorts and had their sleeves rolled up." At one time, "illustrative of the risks of a hyperendemic area", the D.A.D.M.S., the A.D.M.S., and the G.O.C. all fell victims to malaria. "At the end of December the malarial incidence rate, which had reached 33 per 1000 per week in September (1716 per 1000 per year) rose to 82 per 1000 per week (4264 per 1000 per year); at this rate the force would have fallen to zero in three months." We are told that the matter was brought to the personal notice of General Blamey by Brigadier W. W. S. Johnston and also by Lieutenant-Colonel E. Ford, who was assistant director of pathology of the New Guinea Force, although not yet officially appointed as such. Ford "placed the position before" Blamey. This must be one of the greatest understatements of the war history. First hand accounts of what actually happened are that Ford let himself go properly, and told Blamey in language which as an Australian he could not fail to understand, that unless something was done there would soon be no Australian Army. "Blamey not only showed sympathetic interest", but took immediate action. Dr. Walker states that the effect of Blamey's authority was soon felt. "The over-night appearance of a growing labour force, the clearing up of the hitherto obscure delays in supplies, the provision of a special officer to speed on these vital items to their destination and the emphasis laid on personal responsibility of all ranks brought about welcome changes." Very important also was the recognition of the principle that patients suffering from malaria should be as far as possible retained for treatment in New Guinea and not sent back to Australia.

The subject of malaria must not be left without reference to "Atebrin", the drug which was adopted in the prophylaxis of the disease. The history of the investigations at Cairns, carried out under the direction of Brigadier N. H. Fairley, is well known and has been described in this journal on several occasions. It is worth while to recall the epidemic of malignant malaria that occurred in the Aitape-Wewak area. The routine which was adopted for the use of "Atebrin" as a suppressive drug was exceedingly strict. Many officers maintained that in spite of these measures it was possible to contract malignant malaria. There arose an hypothesis that there existed in the Aitape-Wewak area a relatively "Atebrin"-resistant parasite, the so-called "X" factor. Later on Fairley "proved beyond doubt" that there existed in this region a strain of parasite which was relatively resistant to "Atebrin". Even without the presence of such a strain it is clear that absence of clinical malaria is due to the care with which preventive measures are carried out. It is a matter for each individual, but there must be supervision. Here the duty lies not with the regimental medical officer alone, but (and this is emphasized throughout the whole narrative) also with the platoon and company officers. In some spheres of military activity the malarial rate became very low; the ideal of complete elimination could probably never be attained. One enthusiast, we are told, expressed the view that every sufferer from malaria should be regarded as though he was suffering from a self-inflicted wound. We have already noted that the D.A.D.M.S. and the A.D.M.S. of a certain area, and also the G.O.C., suffered from malaria. Imagine these persons in the category of soldiers with self-inflicted wounds!

Chapters are devoted to the Buna Campaigns, to Wau-Salamaua, to the Huon Peninsula Campaigns, to the Markham and Ramu Valleys, to Bougainville, to New Britain and to Borneo. Each area had its own difficulties. Our author tells a plain and straightforward tale of what happened. Everywhere courage and high purpose were shown—the illustrations in this book are alone evidence of what was faced, endured and overcome. The whole book is a story of preventive medicine, of the part which the medical profession can and must play in such an event. Dr. Walker writes that responsibility is a jealous privilege of the medical profession; it is essential for the maintenance of the closest relationship between the sick and the healer. He quotes a statement from the *British Medical Journal* to the effect that "the quality of medicine will suffer by every diminution of the doctor's responsibility". The qualities displayed in times of war are just as desirable in those of peace. Dr. Walker refers in his "Epilogue" to the quotation from Amiel, with which he started, as an "ideal of life triumph over sickness of body and spirit". We may conclude with the two last paragraphs of this book:

> The medical profession in Australia has brought forth a number of distinguished members who have made many noteworthy contributions to medical science as studied in the tropics. The problems of the tropical areas of the world are many and great, and Australia must bear her own increasing share. Opportunity stands waiting today and many specialised workers are needed. Australia could not have been made safe in the years of war without the toil and effort poured out on the field of battle, and the medical workers played their part in those technical labours which did much to mitigate losses of life and of the ability fully to live. It must be realised too, that the practical action which inspired medical work in the Pacific Islands was not based merely on a desire to benefit our own people, for the claims of those peoples indigenous to the country were beyond question.
>
> To ideals, then, we must add action: the flame of health of body, mind and spirit must be tended and kept aglow; our corporate and individual safety depend upon it. The hand that seizes responsibility and uses it as an unselfish weapon is the hand that gives freedom.

Current Comment.

ACUTE CORONARY INSUFFICIENCY.

DISEASE of the coronary arteries may cause no symptoms or it may show itself in various ways. In its acute manifestations the two pictures most commonly recognized are at the extremes of the overt disease—*angina pectoris* and acute coronary occlusion. In between, as A. M. Master, H. L. Jaffe, L. E. Field and E. Donoss[1] have pointed out, is an extremely important, large, variegated group of acute coronary episodes, to which they have applied the term "acute coronary insufficiency". The essential feature of these episodes is a sudden transitory inadequacy of the coronary circulation for the requirements of the myocardium. It may occur spontaneously, or be induced by

[1] *Ann. Int. Med.*, October, 1956.

factors which increase the work of the heart, decrease the coronary flow or alter the composition of the blood. Usually a combination of these factors exists. Master and his colleagues consider that acute coronary insufficiency is a specific clinical, electrocardiographic and pathological entity, differing from both *angina pectoris* and acute coronary occlusion. They state that it indicates a more prolonged and severe state of myocardial ischæmia than does angina, yet does not present the characteristic electrocardiographic and laboratory features of major infarction secondary to coronary occlusion. There is no change in the heart sounds, and no pericardial rub, heart failure or peripheral embolism. However, mild fever, slight leucocytosis and a small increase in sedimentation rate may appear if significant subendocardial necrosis results. At post-mortem examination, no acute thrombus is found in the coronary arteries.

Acute coronary insufficiency is stated to be more common than acute coronary occlusion, but may be so mild as to escape recognition. It can develop spontaneously, but it may follow severe hæmorrhage, tachycardia, marked physical exertion, emotional upset, trauma (surgical or accidental), sudden hypertension, shock, pulmonary embolism and infarction, severe infections and heart failure. Prompt and efficient treatment of the precipitating factor may terminate the resultant coronary insufficiency, and may even prevent it. The presence of a precipitating factor in a coronary episode suggests the presence of coronary insufficiency rather than occlusion. When coronary insufficiency occurs spontaneously, it may resemble coronary occlusion with mild manifestations. However, the electrocardiographic picture usually serves to distinguish them. Coronary insufficiency may very occasionally cause sudden death; but when the patient survives the onset, the prognosis is better than that following occlusion.

The treatment of the two conditions differs, and hence the recognition of acute coronary insufficiency is essential. The electrocardiogram in acute coronary insufficiency may remain normal or unchanged, and presumably this indicates a mild degree of subendocardial ischæmia or necrosis. More commonly there is *RST* depression with *T*-wave inversion, changes which simulate those produced by digitalis and numerous extracardiac conditions, such as infections, acute abdominal diseases and electrolyte disturbances. These changes may persist for several hours or days (when ischæmia alone is present), or for several weeks or longer (when definite subendocardial necrosis occurs). Generally these graphic changes appear soon after the occurrence of acute coronary insufficiency, but occasionally they are delayed for several days and rarely for one or two weeks. In cases of uncomplicated coronary insufficiency, chair rest or merely house confinement for a period of usually one or two weeks is best prescribed; this obviates protracted immobilization with the accompanying hazards of peripheral thrombosis. Most patients make a complete recovery and resume work in several weeks. Mural thrombi do not occur in coronary insufficiency; so anticoagulants need not be administered. More than two-thirds of the attacks of coronary insufficiency follow a benign course, but others are more prolonged and severe and may persist for several weeks or months. An attack of coronary insufficiency may represent the "premonitory phase" of coronary occlusion; and although anticoagulant therapy has been recommended in this phase, Master and his colleagues are of opinion that it does not prevent the final occlusion.

Master *et alii* point out that the term "myocardial infarction" used alone is ambiguous and confuses nomenclature and treatment. If it is employed, they recommend that the terminology should be "myocardial infarction secondary to acute coronary insufficiency" or "myocardial infarction secondary to acute coronary occlusion". Acute coronary insufficiency, as they define it, is a distinct entity with predisposing and precipitating factors, a definite physio-pathological mechanism, characteristic location of the ischæmia or necrosis in the subendocardium, and a more or less characteristic electrocardiogram. Because acute coronary insufficiency can be prevented in the vast majority of instances, and can usually be cured, its clinical recognition and its differential diagnosis from coronary occlusion are essential for definitive treatment.

PENALTY OF ISOLATIONISM.

"PENALTY OF ISOLATIONISM" is the title of an article by Selman A. Waksman appearing in the American journal *Science*. It points out how easily overlapping can occur and identical natural substances or synthetic products be found in different countries and given different names, bringing confusion to research workers and the reading medical practitioner.[1] In 1946 a new antibiotic called "grisein" was described; then five years later there was published the result of work, mostly by Russians, announcing a new antibiotic called "albomycin". Attention was soon directed towards the great similarity of the two: each contained iron, and deprived of this iron both colour and antibiotic activity were greatly reduced; both were non-toxic to mammals; both operated on the same range of bacteria, and they resembled each other in adsorption characteristics. It is highly probable that the two are identical. Recently in four different laboratories in Western Europe and the United States four antibiotic preparations were prepared and separately named which proved to be one and the same substance. The isolation of an antibiotic requires expert knowledge in botany, bacteriology and organic chemistry, and its testing must be clinical. The possibilities of faulty or incomplete research being published are great. There is one factor besides geographical and linguistic dissimilarity fostering such reduplication not mentioned by Waksman, and that is the race for priority in research institutions; these view each other with rivalry, usually a quite healthy rivalry, but apt to lead to premature publication or, as an American critic put it, "going off at half-cock". To prevent such waste of effort and confusion in terminology Waksman makes a final suggestion:

> The repetitions and the frequently unjustified creation of "new species" of antibiotic-producing organisms and of "new antibiotics" can be avoided only by close collaboration amongst the scientific workers throughout the world. The creation of an International Antibiotics Board is also highly essential at the present time.

Antibiotics are by no means alone in displaying this perplexity. Even today there is not complete uniformity amongst civilized peoples in the naming of vitamins, whilst the description of the factors involved in blood coagulation is obscure through what Bunyan called "the discouraging clouds of confusion". If one and the same coagulation precursor is given such divergent names as "Factor VII", "serum prothrombin conversion accelerator" and "convertin", what likelihood is there of comprehension except by the very few persons engaged in research in that field?[2] The publication of specialized periodical literature helps a good deal; so do symposia; but perhaps the greatest hope lies in the adoption of a *lingua franca* for exposition and debate. Sooner or later this last-mentioned must be seriously considered.

RAINMAKING.

AMONG the witch-doctor fraternity rainmaking is often an important activity, but it does not appear in the curriculum of the modern medical student. To that extent perhaps we must put it down as a lost medical art. However, it has engaged the attention of the physical scientists in recent years, and because of this scientific interest and its great topical importance it seems justified to refer to the research in this field carried out by the Division of Radiophysics of the Commonwealth Scientific and Industrial Research Organization. In a recent communication from this source it has been pointed out that now we do indeed know how to induce rain artificially.

[1] *Science*, March 29, 1957.

[2] See review of Erwin Deutsch's *"Blutgerinnungsfaktoren"*, M. J. AUSTRALIA, December 10, 1955.

Rain cannot be produced from a blue sky; but when the right clouds appear, they can be made to yield up their rain.

The research of the Division of Radiophysics has shown that there are two main processes in natural rain formation. The process which operates in any particular cloud depends on its temperature. A cloud is formed when rising moist air is cooled sufficiently to condense out liquid water droplets. Although the droplets may grow in size by further condensation, this process alone generally does not produce droplets large enough to form rain. The basic problem in rainmaking—natural or artificially induced—is to convert a very large number of these droplets of an average size less than one-thousandth of an inch into a smaller number a hundred or more times larger.

The tiny water droplets in a cloud remain liquid at well below freezing point—such a cloud is called a "supercooled" cloud. If ice crystals appear in the cloud they grow rapidly at the expense of the droplets. They collect into snowflakes, which fall through the cloud, growing larger by collision as they fall. As they reach the warmer parts of the cloud, they melt and form raindrops, which emerge from the bottom of the cloud as rain. In nature these ice crystals apparently form on "freezing nuclei", which are minute impurities in the air. Little is known about their nature and characteristics, although it is known that they vary widely in their effectiveness. Dr. E. G. Bowen, Chief of the Division of Radiophysics, has suggested that many of them may be meteoric dust which has fallen into the earth's atmosphere from outer space.

Supercooled clouds can be made to give up rain by dropping pellets of dry ice through the cloud. The dry ice is at a temperature of −80° C., and each particle as it falls produces millions of tiny ice crystals. In practice tens of pounds or even hundreds of pounds of dry ice are required per mile of travel of the aircraft to produce enough ice crystals to induce rain. This makes it a hopelessly uneconomic method for use over wide areas. It has been found, however, that crystals of silver iodide are capable of forming ice crystals in supercooled clouds. When a solution of silver iodide is burnt in a hot flame the resulting "smoke" of fine crystals can start ice crystal formation at temperatures of −5° C. or lower. This is of special importance since ice crystals do not usually appear in a cloud naturally until the temperature falls below −15° C. This means that silver iodide can start rain in clouds which are warmer than −15° C. and which are therefore not likely to produce rain naturally.

A relatively small amount of silver iodide can seed an extensive area of cloud. It remains active in the air for some hours after release from the aircraft. It therefore provides a practical technique for artificially inducing rain from supercooled clouds. Originally proposals were made for seeding clouds with silver iodide from burners on the ground. The Division of Radiophysics has shown that this will not work. Not enough silver iodide particles reach the heights of 15,000 to 30,000 feet which are required if they are to influence rainfall. And furthermore, the particles which do rise high enough are no longer in the active state. They are active when produced, but rapidly lose their activity in the warm, dense lower air.

This research has shown that rain can also fall from clouds without the formation of ice crystals. The mechanism is described as "coalescence". When a cloud is formed, some droplets may be larger than others. This is likely to be true if unusually large condensation nuclei (usually particles of sea salt) are present. These large droplets are not carried up in the rising air stream in which the cloud is formed as rapidly as the smaller droplets. They can therefore collide and coalesce with them, and thus grow larger. In favourable conditions, drops large enough to fall as rain are formed in this way. This process can operate in clouds which are warmer than freezing. It happens in many clouds without necessarily producing rain.

Rain can be induced artificially in warm clouds by introducing salt particles into the base of the cloud or even by spraying water droplets into the cloud. However, as with the dry-ice method of seeding, these techniques do not provide a practical economic method for rainmaking, although undoubtedly they will induce rain from warm clouds. At present no economic method is known which will produce rain from warm clouds. Rain from warm clouds occurs frequently in tropical and subtropical regions. It is more common in coastal areas. It depends for its existence on convective conditions and tends to be showery rather than widespread and persistent.

The Division of Radiophysics has found that most of our precipitation, particularly the heavy and persistent rain associated with frontal conditions, comes from supercooled clouds. Fortunately seeding with silver iodide can induce these supercooled clouds to rain. Commonwealth Scientific and Industrial Research Organization scientists have carried out hundreds of tests which demonstrate beyond doubt that this technique works. They have selected a group of suitable clouds in the same general area. After they have been examined with a special radar which does not "see" the cloud droplets, but can detect the larger raindrops which may be hidden in a cloud, one of the clouds is seeded. By means of the radar the rain-forming process can be "seen" to operate shortly after the cloud is treated, and rain appears at the cloud base usually about twenty to twenty-five minutes later.

Artificial rainmaking is unlikely to be of economic importance unless methods are available which can be applied easily and cheaply on a wide scale. It is no use relying on methods which involve treatment of individual clouds. Silver iodide released from aircraft remains active at cloud level for several hours in daylight and for a much longer time at night. It can readily be dispersed over a very wide area. This provides a method which can be applied for practical rainmaking. At the same time the fact that silver iodide can successfully induce rain to fall from suitable cloud systems does not necessarily mean that there will be an increase of rainfall over an area if the process is repeated a large number of times. The possibility exists that in each case the clouds might have rained naturally if left alone for a little longer.

It is vital to have a reliable answer to the question: can we increase the annual rainfall over an area? If this is possible, the economic gain will be great, and the expense of flying aircraft for weather modification may easily be justified. A critical experiment to answer this question was started by the Commonwealth Scientific and Industrial Research Organization in July, 1955, in collaboration with the Snowy Mountains Hydro-Electric Authority. Two adjacent areas, each about 1000 square miles in extent, have been selected. Rainmaking is being attempted over one area (the target area), and the other is not being seeded (the control area). The effect of seeding is obtained by comparing the rainfall which falls on the two areas. To provide a sound basis for the comparison, the target area is seeded only on roughly half of the occasions when conditions are suitable. The occasions for seeding are chosen at random, and this enables the normal chance variation in rainfall to be allowed for in the analysis of the results. Results so far are distinctly promising. During 1955 substantially more rain fell on the target area than on the control area during the periods when seeding was carried out. This occurred again, but to a somewhat lesser extent in 1956. It is known that natural rainfall can vary greatly between places not far apart, and so any experiment which is designed to modify rainfall must be continued for a period long enough to smooth out these natural and unpredictable variations. In the present trials a minimum period of three years will be required before the results can be judged to be reliable.

The 1957 season's operations have just started. If these continue to show the same trends, it should be possible at the end of the year to estimate the extent of rainfall increases which may be expected in areas of Australia where conditions similar to those in the Snowy Mountains region exist—for example, parts of the western slopes in New South Wales. A further series of tests in a second typical area of Australia are now being undertaken over the Mount Lofty ranges north of Adelaide.

Abstracts from Medical Literature.

RADIOLOGY.

Röntgen Criteria of Impending Perforation of the Caecum.

L. DAVIS AND R. LOWMAN (*Radiology*, April, 1957) made measurements of the greatest transverse diameter of the caecum on a film of the abdomen, taken with the patient in the prone position, in 19 cases of large-bowel obstruction with caecal distension, the distension having been induced artificially by the injection of air and barium. On this basis a diameter of nine centimetres was established as the critical figure beyond which danger of perforation exists. The reduction in mortality when therapeutic measures are instituted before complete perforation, while the caecal mucosa is still intact, indicates the need of a criterion of this nature.

Congenital Goitre.

W. W. NAGLE, J. W. HOPE AND A. M. BONGIOVANNI (*Radiology*, April, 1957) report three areas of congenital goitre and discuss the radiological and clinical findings, pathology, ætiology and treatment. A review of the literature is included. The patient with congenital goitre is born with a mass in the thyroid region, which usually is soft and symmetrical. Radiological examination generally shows an evenly outlined soft-tissue mass in the thyroid area that surrounds the trachea and may compress and displace the œsophagus. Maternal thyroid disease and the ingestion by the mother of goitrogenic drugs, the goitrogenic action of calcium in iodine-poor areas and the geographic "goitre belts" are considered in relation to ætiology. It is concluded that the exact mechanism responsible for the development of congenital goitre remains unknown.

Total Unilateral Pulmonary Collapse.

M. LUBERT AND G. R. KRAUSE (*Radiology*, August, 1956) attempt a complete analysis of the lateral radiograph of the chest in varying degrees of unilateral pulmonary collapse. The net difference in pressure between the two halves of the thorax which results when a lung collapses is exerted on the mediastinum. The weaker, anterior mediastinum shifts most toward the affected side. The normal, contralateral lung moves in front of the heart and aorta, displacing the affected lung postero-laterally and downward. This accounts for the following appearances in the lateral radiograph: (*a*) increase in size and radiolucence of the anterior mediastinum with posterior displacement of the heart and great vessels; (*b*) generalized postero-inferior increase in density; (*c*) delineation of the margin of the collapsed lung if it is in contact with opposite, over-expanded lung at the retrocardiac space (silhouette sign). The final appearance in the lateral radiograph is independent of the side involved or the site of the original endobronchial block. It is essentially the same whether the collapse is due to constricting pleuritis or to fibrosis, or even if the basic abnormality is obstructive emphysema of the opposite lung. In massive unilateral pneumonia the anterior mediastinum does not change appreciably in appearance; in massive effusion the radiolucent shadow of the anterior mediastinum is obliterated. A large amount of pleural effusion will overshadow an area of collapse or of pneumonia in the lateral view. Visualization of the individual structures of the mediastinum will depend on whether they are entirely in contact with an area of fluid pneumonia, or collapsed airless lung. If there is appreciable contact with the aerated lung in a plane tangential to the ray in the lateral view, the structures can be distinguished (silhouette effect).

The Sialographic Differentiation of Mikulicz's Disease and Mikulicz's Syndrome.

P. RUBIN AND B. E. BESSE, JUNIOR (*Radiology*, April, 1957), state that Mikulicz's disease and Mikulicz's syndrome can be differentiated on the basis of sialographic studies. In Mikulicz's disease, which originates in the salivary gland, sialectasis or terminal duct dilatation characterizes the early to moderately advanced stages. In Mikulicz's syndrome, which secondarily involves the salivary gland, sialograms taken in the early to moderately advanced phases show the gland architecture to be intact but displaced laterally. In the end stages of both Mikulicz's disease and Mikulicz's syndrome, the gland architecture is completely replaced or destroyed. In Mikulicz's disease, the radio-opaque medium can be readily injected, and makes its way into the septa of the gland, in contrast to Mikulicz's syndrome, in which the main duct is obstructed and injection is impossible.

RADIOTHERAPY.

Radiation Therapy of Neuroblastoma.

W. B. SEAMAN AND M. D. EAGLETON (*Radiology*, January, 1957) describe the results of radiation therapy in 19 cases of neuroblastoma and review the literature. Most neuroblastomata are radiosensitive, and numerous cases are described in which children have survived for three years or more, even in the presence of liver metastases. In assessing the results of therapy, it is impossible to evaluate the tendency toward spontaneous regression or differentiation into a more mature tumour. It has been suggested that such a tendency may be enhanced by a variety of agents, such as X-ray therapy and nitrogen mustard. In the authors' series, five of the 19 patients have survived for three years or longer after radiation therapy, and two of the surviving patients had histologically verified metastases, in one case in the liver, in the other involving several bones. The authors note that there is a higher survival rate in the younger age groups. They conclude that because of the occasional survival of patients with metastases, extensive disease should not be a contraindication to radiation therapy.

New Drugs for Irradiation Sickness.

B. A. STOLL (*Radiology*, March, 1957), working at the Peter MacCallum Clinic, has conducted a controlled trial using pyridoxine hydrochloride, chlorpromazine, cyclizine and "Pacatal" in the treatment of irradiation sickness. A previous investigation had shown pyridoxine to be the most efficacious of drugs available at the time, and the three new drugs were compared with this drug. "Pacatal" was found to be statistically superior to pyridoxine and the other drugs. When symptoms were due to irradiation of the abdomen, chlorpromazine was nearly as efficacious, but its administration led to a feeling of sleepiness which was disadvantageous in ambulatory patients.

Treatment of Hæmangioma with Strontium^{90}.

D. N. SKLAROFF (*Radiology*, January, 1957) discusses the treatment of hæmangiomata of the "strawberry" type using a strontium applicator. This is a nearly pure β ray emitter, having a depth dose of 50% at one millimetre. Ten patients have been treated with satisfactory results. If the hæmangioma is more than two millimetres in thickness, this treatment is not used. The applicator is described.

Primary Vaginal Cancer: Irradiation Management.

W. T. MURPHY (*Radiology*, February, 1957) discusses the treatment by irradiation of primary vaginal cancer in 138 patients between 1919 and 1949. The following methods of treatment were used, either alone or in combination: radium surface application, implantation of radium needles or radon seeds, transvaginal X-radiation and external irradiation. The techniques used are described. The patients were staged in the following groups: Stage I, lesion limited to vagina or immediate paravaginal tissue; Stage II, (i) extension beyond immediate paravaginal tissues, (ii) invasion of urethra, bladder, rectum or vulva, (iii) metastases to regional lymph nodes; Stage III, patients previously treated in other hospitals. The absolute proportion of five-year cures in patients who received the full treatment (Stages I and II) amounted to 24·2%. This represented 31·6% in Stage I and 11·1% in Stage II. Consideration of the patients treated after 1940, since when dosage has been more adequate, showed the following five-year cures: Stages I and II together, 46·2%; Stage I alone, 69·2%; Stage II alone, 23%. The details of results according to the exact method of treatment are presented in tabular form.

Malignant Lymphoma.

L. F. CARVER (*Am. J. Roentgenol.*, November, 1956) discusses malignant lymphomata and poses several interesting concepts about the origin and behaviour of these tumours. He discusses the uses of P^{32}, antimitotic agents (nitrogen mustard and T.E.M.) and their effects. In planning treatment he divides the disease into three stages. In Class I

the condition is unicentric, with the disease in one site, and there are no constitutional symptoms; for this there should be an aggressive policy such as localized irradiation. In Class II the condition is beginning to spread but is regionally confined; here again fairly aggressive treatment should be given in the hope of long control. In Class III there is generalized disease, more or less pronounced, with constitutional symptoms. This last stage the author regards as more like leuchæmia, and considers that it is best treated cautiously, the aim being to keep the patient in comfort for the longest possible time.

PATHOLOGY.

Hypophysectomy for Cancer.

O. N. BARRON (*J. Clin. Path.*, November, 1956) describes 13 cases in which hypophysectomy was performed in the Royal Free Hospital in the treatment of carcinoma of the breast in women. In his series, two patients died within forty-eight hours of the operation; five patients died within six months of the operation, some of them having had relief of pain for varying lengths of time; one patient is still alive, having had relief of pain, but little objective slowing of the rate of growth of the tumour; five patients have had relief of pain and a remarkably increased sense of well-being, with slowing of the rate of growth in some and disappearance of local or distant metastases in others. The post-operative care is easier than after adrenalectomy, though the operation itself is technically more difficult. Biochemical control of these patients and the problem of assessing whether complete removal has been effected are discussed.

Lung Cancer Diagnosis: New Method.

I. S. EPSTEIN, M. G. SEVAG AND F. E. BROWN (*Cancer*, November-December, 1956) compare a new method for diagnosis of bronchogenic carcinoma with the known methods. The material of the survey comprised 54 patients with bronchogenic carcinoma, and 56 without. The new method consisted in estimating the percentage of blood-free solids in bronchial washings. Any figure over 4% was regarded as indicating cancer. The results of the test were compared with results from X-ray examination, bronchoscopy and the Papanicolaou test. The new test gave comparable results.

Nasal Carriers of Staphylococci.

S. K. R. CLARKE (*J. Path. & Bact.*, January, 1957) conducted an experiment upon nasal carriage of *Staphylococcus aureus* for a period of ten months in two male wards of 24 beds each. She found that noses which had been free of staphylococci for a long time and those that had been free for only a short time acquired staphylococci with equal ease. On the other hand, there was considerable variability in the ease with which they could rid themselves of staphylococci once acquired. Antibiotics given systemically removed staphylococci from the nose; staphylococci colonized noses which harboured no other staphylococci much more easily than those which were already occupied by staphylococci. These two findings explain the development of antibiotic-resistant strains in hospitals. The same mechanisms probably occur in other parts of the body, such as wounds. Another finding was that persons who harboured *S. aureus* for a long time in the nose lost the organism less readily than those who had been carriers for a short time.

Post-Intubation Granuloma of Larynx.

W. S. HOWLAND AND J. S. LEWIS (*Cancer*, November-December, 1956) have investigated the occurrence of granuloma of the vocal cords following the administration of endotracheal anæsthetics. There were 17 examples of this disorder, which averaged one case to every 1000 intubations. All intubations were performed under direct laryngoscopy. The operation and the type of anæsthesia and its duration seemed to be of little importance in the genesis of the disorder. The time of discovery of the granuloma varied from two to twenty-eight weeks after the operation. In one case the larynx was normal at the end of the sixteenth week, but a granuloma developed by the end of the twenty-eighth week. Of the 17 cases, 15 were in females, and there was a preexistent respiratory infection in more than half. However, the features of most significance seem to be the position of the head (extended in 11 of the 17 cases) and size of the catheter relative to the opening in the glottis (smaller in women than in men).

Aortitis in Rheumatoid Arthritis.

J. VALAITIS, C. G. PILZ AND M. M. MONTGOMERY (*Arch. Path.*, March, 1957) describe an unusual type of aortitis with aortic valvular insufficiency occurring in a man, aged thirty-eight years, with rheumatoid spondylitis. The dilated root of the aorta showed several small aneurysmal outpouchings and marked wrinkling of the intimal lining. The rolled aortic leaflets were inverted, and the aortic ring was also dilated. The microscopic findings were those of necrosis of tissue with focal fragmentation of the elastica, preservation of the reticulum and cellular infiltration. These findings are interpreted as representing a modification of the necrobiotic lesions of rheumatoid arthritis. Histologically, they can be differentiated from the lesions of syphilis and those of rheumatic fever. The described deformities of the aorta and aortic valve, according to the authors, are caused by fibrosis of necrobiotic rheumatoid lesions.

Ectopic Ovarian Decidua.

W. B. OBER, H. G. GRADY AND A. K. SCHOENBUCHER (*Am. J. Path.*, March-April, 1957) describe 16 examples of ectopic decidual reaction in the ovary in the absence of current or recent pregnancy. In 14 of the 16 cases, a functioning *corpus luteum* which had undergone disruption was present nearby; in one case the presence or absence of a *corpus luteum* could not be determined. An adrenal rest but no *corpus luteum* was observed in one case, and in two cases nests of hilar cells were seen. Periovarian adhesions were present in 14 cases; radiation therapy had been given in nine cases; endometriosis was an associated condition in five cases. The decidual reaction is defined as an inherent and unique property of the mesenchyme of the uro-genital ridge and its derivatives. In the ovary the transformation usually occurs in an inconspicuous layer of cells normally located just below the mesothelial surface. Decidual reactions in the absence of pregnancy are similar to experimentally produced deciduomata. The decidual response follows stimulation of appropriate cells by progesterone or progesterone-like substances, elaborated usually in the *corpus luteum*, but in its absence, possibly in the adrenal cortex.

Splenic Anæmia.

E. R. GIBLETT, A. G. MOTULSKY, F. CASSERD, B. HOUGHTON AND C. A. FINCH (*Blood*, December, 1956) produced splenomegaly in rats by intraperitoneal injections of methyl cellulose. As the spleen enlarged, a typical hæmolytic anæmia developed. Splenectomy then significantly diminished the hæmolytic process. Administration of methyl cellulose to splenectomized rats had no effect upon red-cell life span, nor did "tagged" red blood cells from treated rats have a shorter survival time when injected into normal rats. There was no inhibition of bone marrow, which became hyperplastic, and this was reflected in a prominent reticulocytosis. The Coombs tests gave negative results. The anæmia seemed to be due to phagocytosis of the red cells, which became sequestrated in the enlarged sinuses of the spleen, for erythrophagocytosis was observed in the cells which stored methyl cellulose.

Eosinophilic Granuloma of Lung.

D. AULD (*Arch. Path.*, February, 1957) has reviewed the literature and describes three new cases of eosinophilic granuloma of the lung. There have been no autopsies, and the material for study has all been obtained by thoracotomy. The clinical picture of the process was usually mild, except when pneumothorax supervened. Other symptoms are cough, dyspnœa, chest pain and weight loss. The physical signs were indefinite. There was usually a leucocytosis with some degree of eosinophilia. The X-ray film usually showed a diffuse bilateral infiltrate, and occasionally there was cystic emphysema. The erythrocyte sedimentation rate was elevated and the serum globulin content increased in some patients. Treatment with steroids and X-ray irradiation gave promising results in some of the cases under review. While spontaneous improvement occurred without any treatment, reversion to normal occurred only in the treated patients. The lesions are multicentric granulomata associated in some cases with arteriolitis. The older lesions may undergo necrosis and the mass may be coughed up. In other cases fibrosis results. There is no indication of the ætiology. The lesions resemble those of periarteritis and also those of Löffler's syndrome. The author thinks it is a manifestation of hypersensitivity.

British Medical Association.

THE OTO-LARYNGOLOGICAL SOCIETY OF AUSTRALIA (BRITISH MEDICAL ASSOCIATION).

THE annual general meeting and the scientific meeting of the Oto-Laryngological Society of Australia (British Medical Association) were held in Adelaide from August 21 to 24, 1956, DR. R. M. GLYNN, the President, in the chair.

ANNUAL GENERAL MEETING.

Election of Office-Bearers.

The following office-bearers were elected: *President*: Dr. R. M. Glynn. *Vice-President*: Dr. A. S. deB. Cocks. *Secretary-Treasurer*: Dr. R. N. Reilly. *State Representatives*: New South Wales, Dr. V. G. Bulteau; Victoria, Dr. D. Cossar; Queensland, Dr. A. K. Green; Western Australia, Dr. N. M. Cuthbert; South Australia, Dr. R. N. Reilly.

General Business.

The annual report of the Council and the treasurer's report and financial statement were presented and adopted.

A number of alterations of the constitution were discussed and some adopted.

It was decided to hold the 1957 annual general meeting and the scientific meeting in Melbourne in August.

SCIENTIFIC MEETING.

Ultrasonics and Their Relation to Medicine.

DR. D. H. LE MESSURIER (Adelaide), by invitation, presented a paper entitled "Ultrasonics and Their Relation to Medicine" (see page 37).

DR. G. C. HALLIDAY (Sydney) said that it seemed that ultrasonics were gradually finding a place in medicine, and might well become a useful addition to their armamentarium.

DR. R. N. REILLY (Adelaide) said that he had seen Professor Arslan use ultrasonics in Padua in a case of Ménière's syndrome, by direct application of the tip of a special transducer to the region of the otic capsule after its exposure by a posterior approach through the mastoid. With that method Arslan claimed to be able to destroy the vestibular apparatus without damaging the cochlea, and that appeared to be so in that particular case seen. Of 88 cases of Ménière's syndrome treated in that manner up to January 15, 1955, Arslan claimed (i) complete relief from vertigo in 95% of cases with no recurrence in periods of up to two and a half years, (ii) a remarkable improvement of hearing in the lower and middle frequencies in the majority of cases, and, (iii) on the whole, a distinct decrease in the tinnitus, which he said had disappeared in some cases. Dr. Reilly said that in a letter dated July 21, 1956, Professor Arslan stated that a recent review of 200 patients treated by that method since 1952 showed that 95% had obtained relief of vertigo, 45% had decreased tinnitus, 30% had improved hearing, and none of the 200 had impairment of hearing.

Notes on Some Nasal Procedures.

DR. T. G. MILLAR (Melbourne) presented a paper entitled "Notes on Some Nasal Procedures" (see page 42).

DR. A. QUAYLE (Brisbane) said that he made an entrance to the fronto-nasal duct by removing the medial wall of the anterior ethmoid cells. There was not much risk of causing stenosis, because he retained the mucosa on the lateral wall of the ethmoid cells. He had found at times that alteration of the shape of the cannula was helpful.

DR. C. L. ROSEFIELD (Melbourne) said that in the diagnosis of frontal sinusitis the X-ray picture was not always helpful. He had seen a patient with severe frontal pain whose X-ray picture was clear.

DR. R. M. GLYNN (Adelaide) said that he had seen two patients with post-operative antral cyst. It was difficult to know what to do with them.

DR. G. C. HALLIDAY (Sydney) said that he believed that those cysts arose from the antero-medial angle of the antrum. He always removed the whole of the angle and turned down a flap from the medial wall onto the floor. The late Dr. R. S. Godsall had held that that was a most satisfactory and care-free nasal operation.

Dr. Glynn said that he disagreed with Dr. Millar's views on not using a tape through the mouth in post-nasal packing. Dr. Glynn thought that it was much safer to use such a tape.

DR. A. B. K. WATKINS (Sydney) said that he used two post-nasal plugs, each with two white threads attached to them. One thread from each pack was brought out through each nostril, and the two were tied together across the columella; the other two tapes were brought out through the mouth.

DR. A. BRYANT (Sydney) said that he thought it was much safer to bring a tape out through the mouth.

Dr. Millar, in reply, said that he preferred to differ from Dr. Quayle with regard to the new opening to the fronto-nasal duct. In reply to Dr. Halliday's remarks, Dr. Millar said that, as obliteration of the frontal sinus resulted in cure, he used to aim at obliteration of the antrum by complete removal of the anterior wall, but now he removed only what was necessary for access.

Problems in Aural and Nasal Reconstruction.

DR. A. B. K. WATKINS (Sydney) presented a paper entitled "Problems in Aural and Nasal Reconstruction", which he discussed from several angles, illustrating the various difficulties with the aid of some 47 slides of photographs and diagrams. Part of this paper is published in this issue at page 43.

DR. R. H. VON DER BORCH (Adelaide) asked what was the best way of dealing with cases of occlusion of the external auditory canal by multiple osteomata.

DR. D. G. CARRUTHERS (Sydney) asked what was an acrylic-tantalum graft. He also asked how Dr. Watkins dealt with the patient who needed an incurving or depression between the eyes.

DR. A. S. DEB. COCKS (Adelaide) asked how one could make a satisfactory subperiosteal pocket for insertion of a graft into the bridge of the nose.

DR. A. QUAYLE (Brisbane) asked what type of incision was used for insertion of the graft.

DR. F. F. ELLIS (Sydney) said that he had recently attended a course arranged by the American Rhinologic Society. He thought that nasal reconstruction would form a large part of the oto-laryngologist's work in the future. There were three main sections of the work: (i) septum work, which was done by working backwards from the maxillary spine; (ii) hump work, which resolved itself broadly into two methods—(*a*) the routine way of cutting off and infracture, and (*b*) infracture followed by pushing the nose down into the face; (iii) work on the lobule. The most important thing was not to hurry in doing that work. At the New York Eye and Ear Infirmary, child's cartilage was being used. It was claimed that that did not twist and gave 100% "takes".

Dr. Watkins, in reply to Dr. von der Borch, said that it was best to use a posterior incision near the crease of the ear, to reflect the skin off the osteomata as a tube and then to deal with the osteomata. One had to remember possible distortion of position of the facial nerve. It was sometimes wise to take away some mastoid bone to enlarge the cavity. Then the tube was cut and packed into place in the enlarged canal. Burrs or chisels could be used to remove the osteomata. Dr. Watkins thought that the Tumarkin chisels were the most useful.

In answer to Dr. Carruthers's first question, Dr. Watkins said that there were two main kinds of acrylic—(*a*) that used for taking impressions for dentures, which was polymerized by heat, and (*b*) that which was polymerized by solution. The latter was bought as a powder and mixed into a paste with a special solvent. It was shaped as it hardened. As the last bit of hardening took place there was a sudden output of heat. It must not be used until after that had happened. One also had to remember that the polymerizing solution was hepatotoxic and highly acid and could cause an acid burn. In the case referred to, the acrylic used was the same as that used by surgeons for insertion in the skull in conjunction with amniotic membrane. Dr. Watkins said that he had built an outer shell of tantalum and had filled in behind it to the required shape with the acrylic. That particular type of acrylic could be boiled after having hardened. To obtain a depression in the nasal bridge, Dr. Watkins nibbled away a little of the glabella after infracting the nasal bones.

In reply to Dr. Cocks, Dr. Watkins said that when he used a cartilage graft he always applied a splint to the nose

afterwards. In the first week any sideways movement of the graft could be corrected by the fingers. When he used a tantalum graft, he lifted a chip from the nasal bones with a chisel and inserted the graft under it.

In reply to Dr. Quayle, Dr. Watkins said that he made an incision in the mid-line of the columella. Through that one could put a block of cartilage on the maxillary nasal spine and an L-shaped graft onto the block, or one could use a separate columella graft. If tantalum was used for the columella, it should be fitted into the cartilage part of the graft.

In commenting upon Dr. Ellis's remarks, Dr. Watkins said that the "push back" operation was new to him. He doubted that child's cartilage would permit long enough pieces to be used for that work.

Infections of the Mouth.

DR. B. B. BLOMFIELD (Sydney) presented a paper entitled "Infections of the Mouth" (see page 50).

DR. A. J. HAKENDORF (Adelaide) opened the discussion by invitation. He said that Dr. Blomfield had brought to notice three well-known bullous eruptions involving the skin and the oral mucosa—namely, pemphigus, *erythema multiforme exudativum* (Stevens-Johnson syndrome) and Behcet's syndrome or triple-symptom complex. He was not surprised to learn that those lesions were seen only on rare occasions by the laryngologist, as they were seen also only rarely by the dermatologist. During the last five years in private practice and in one dermatological clinic at the Royal Adelaide Hospital, out of approximately 10,000 new skin cases, there had been only two cases of *pemphigus vulgaris*, and only two cases of Stevens-Johnson syndrome—one in 5000 cases. There had not been a single case of Behcet's syndrome in Adelaide during that period. However, he could recall having seen two patients with Behcet's syndrome during the last five years, one in London and one in Melbourne, and those had been at dermatological clinical meetings. Behcet was a Turkish dermatologist, and had first described his triple-symptom complex in 1947. The syndrome had been noted previously in 1930. It consisted of (i) ulcers of the mouth, (ii) ulcers of the genitalia, and (iii) eye signs such as retinitis and irido-cyclitis. In some cases lesions of the skin resembling *erythema nodosum* occurred. Behcet had drawn attention to the severity of the eye signs, which often demanded enucleation of the eyes. In one case of Behcet's syndrome which Dr. Hakendorf had encountered, there was an eight years' history of recurrent aphthous ulcers of the mouth, occurring in crops of three or more, and involving the cheeks, the gum margins and the palate. These ulcers were small, about three millimetres in diameter. They tended to heal in about three weeks, but sometimes took a couple of months, in which case they left small scars.

Dr. Hakendorf said that from Dr. Blomfield's remarks, it seemed highly probable that the laryngologist might see some of those patients so affected at a much earlier stage than the dermatologist, and it was not always an easy matter to diagnose any one of those diseases with certainty until the skin eruption occurred. Dr. Blomfield had pointed out that his first case was initially diagnosed as Stevens-Johnson syndrome and later as Behcet's syndrome, and finally settled down to the diagnosis of pemphigus. The diagnosis in his second case seemed certain, because the young man had showed a suspicious lesion on the *glans penis*, and so a diagnosis of Behcet's disease was made; but finally it turned out to be Stevens-Johnson syndrome. Those two cases of Dr. Blomfield clearly illustrated the difficulty in diagnosis of the early case.

Dr. Hakendorf went on to say that the three skin diseases in question were in reality closely related. Stevens-Johnson syndrome was regarded by some as a bullous type of *erythema multiforme* with characteristics of acute pemphigus. Behcet's syndrome was also regarded by some as a variant of *erythema multiforme exudativum* or Stevens-Johnson syndrome. In the differential diagnosis of those bullous eruptions, besides Tsank's test for acantholysis, it was possible to differentiate between the group of bullous lesions which included *dermatitis herpetiformis* and *erythema multiforme*, on the one hand, and the pemphigus group on the other, by the histological examination of an intact bulla. Of course, the same would apply to bullæ in the mouth; but it was practically an impossibility to obtain an intact bulla from the mouth. In the pemphigus group, the bulla was intraepidermal in position, whilst in *erythema multiforme*, the bulla was subepidermal. Dr. Blomfield had given an excellent précis of the signs affecting the mucous membranes, both in Stevens-Johnson syndrome and in pemphigus. There was one important point that had not been mentioned specifically, and that was that in Stevens-Johnson syndrome young adult males were affected in the proportion of six males to one female. In conclusion, Dr. Hakendorf said that he had seen dermatologists, who, after examination of affected patients, had been content to make a diagnosis of bullous eruption rather than endeavour to differentiate between the diseases.

DR. T. G. MILLAR (Melbourne) said that he had seen two patients with Stevens-Johnson syndrome. The clinical impression was that the lesions appeared much more severe than the constitutional disturbance. Those patients had had no toxæmia, only some dehydration.

DR. D. G. CARRUTHERS (Sydney) asked what was the ætiology in those cases. It appeared that cortisone only controlled the condition.

DR. R. M. GLYNN (Adelaide) asked whether the lesions in the mouth were similar in all cases—namely, bullous at first with later infection.

DR. E. A. MATISON (Adelaide) asked what had been the results of bacteriological investigation in Dr. Blomfield's cases.

In reply to Dr. Millar, Dr. Hakendorf said that the patients he had seen had been extremely toxæmic. The diseases could prove fatal in a short time, but usually ran a course of about three weeks. In reply to Dr. Carruthers's questions, Dr. Hakendorf said that the ætiology was unknown and the mode of action of cortisone was unknown; but in cases of pemphigus, if cortisone was given adequately, the patients would recover.

Dr. Blomfield, in reply to Dr. Matison, said that thorough bacteriological investigation of his first patient had revealed nothing of value. He thanked Dr. Hakendorf for his discussion of the conditions involved in the diagnosis of those cases.

Three Interesting Conditions.

DR. V. G. BULTEAU (Sydney) read a paper entitled "Three Interesting Conditions" (see page 52).

DR. R. G. PLUMMER (Adelaide) asked why warm fluid helped the patient with "corkscrew" œsophagus to swallow.

DR. R. M. GLYNN (Adelaide) said that the therapeutic test must be of great assistance in cases of "corkscrew" œsophagus. He asked whether Dr. Bulteau had much difficulty in removing the dermoid, and whether much scarring and contraction ensued.

Dr. Bulteau, in reply, said that warmth apparently helped muscular action. It did not stop the irregular contractions of the œsophagus, but did facilitate swallowing. The dermoid had been difficult to remove, mainly because of its size and the denseness of the capsule. The wound had been packed for two weeks in the hope of preventing contracture, but it was as yet too early to know what the final result would be.

Suprahyoid Cysts.

DR. S. PEARLMAN (Adelaide) read a paper entitled "Internal Suprahyoid Cysts in Infancy" (see page 45).

DR. F. F. ELLIS (Sydney) asked whether vallecular cysts were related to the suprahyoid cyst.

DR. C. CANTOR (Melbourne) said that he had seen a patient with acute laryngeal œdema in whom, after reduction of the œdema, pus had been seen seeping from the region of the *foramen caecum*. When the track was followed into the substance of the tongue, it was found to lead into an unobliterated sac. No attempt had been made to remove the sac, and it was still possible to see a seepage of mucopus on phonation. That case was probably one of infection in a suprahyoid cyst. In reply to Dr. Ellis, Dr. Pearlman said that he knew of no relationship between suprahyoid and vallecular cysts.

Tympanoplasty.

DR. R. N. REILLY (Adelaide) read a paper entitled "Tympanoplasty: A Preliminary Report" (see page 47).

DR. A. S. DEB. COCKS (Adelaide) said that a patient of his on whom a fenestration had been performed some ten years earlier had had *myringitis bullosa* with subsequent postero-superior perforation. He asked whether he should use a free graft in an attempt to close the perforation, and how he should scarify the area.

DR. C. CANTOR (Melbourne) said that he was not impressed with the improvement in hearing following grafting. The

gain was similar to that obtained after modified radical mastoidectomy.

DR. D. G. CARRUTHERS (Sydney) said that he liked to take a split skin graft from the thigh and to graft the whole cavity. He had not found a way to close the perforation in patients with chronic discharge. If full-thickness grafts would do that, then something had been gained. The problem still existed of being sure that one had overcome all the infection present in such cases. He had found the topical application of cortisone useful in the after-treatment of mastoidectomies. He used a mixture of sterile glycerin and ichthyol with cortisone ointment. That produced good, quick healing.

DR. G. C. HALLIDAY (Sydney) said that the general aim of the modified radical mastoidectomy was to maintain hearing. The operation of tympanoplasty was a move in the right direction. He had used another type of plastic operation for closing perforations, particularly in fenestrations, but he had not used the free graft.

DR. F. F. ELLIS (Sydney) said that he had seen Professor F. C. Ormerod in London perform some of those operations. To close perforations, he performed a myringoplasty in which the edges of the perforation were freshened with special instruments, and the graft was placed over the perforation and packed into position with gauze squeezed out of BIPP. The tympanoplasty was performed to produce an inflatable middle ear cavity, and a difference of impedance between the oval and round windows. The graft went on to the stapes.

DR. R. H. VON DER BORCH (Adelaide) wondered whether it was necessary to use a full-thickness graft. He said that Zöllner had originally used full-thickness grafts, but now he was using split skin.

In reply to Dr. Cocks, Dr. Reilly said that a free graft should be successful in such a case. Scarification of the area could be obtained with any fine sharp-edged instrument. He agreed with Dr. Cantor that the improvement in hearing in the cases reported was not very great, but was, nevertheless, encouraging. He thanked Dr. Carruthers for his remarks and his reference to the use of cortisone. He was grateful to Dr. Halliday for the description of his method of closing perforations, and to Dr. Ellis for distinguishing between myringoplasty and tympanoplasty. In reply to Dr. von der Borch, Dr. Reilly said that he agreed that split skin was probably better for lining the mastoid cavity, but he had not tried it for the actual tympanoplasty.

Operative Demonstration.

A number of operations were performed, as follows.

Repair of Bat Ears.

DR. S. PEARLMAN (Adelaide) performed an operation for the repair of bat ears.

DR. R. M. GLYNN (Adelaide) asked in what percentage of cases the condition was bilateral.

Dr. Pearlman replied that bat ears were commonly bilateral. When that was so, one could obtain a more symmetrical and, therefore, a more pleasing result.

Modified Radical Mastoidectomy and Tympanoplasty.

DR. R. N. REILLY (Adelaide) performed a modified radical mastoidectomy and tympanoplasty.

Bilateral Antral Lavage with Insertion of Polythene Tubes.

DR. J. A. B. ROLLAND (Adelaide) performed bilateral antral lavage with insertion of polythene tubes.

DR. C. H. PYMAN (Melbourne) said that he had been following the same idea. He inserted the polythene tube on an ordinary trochar after making a large opening. He did not turn over the end of the tube, nor did he suture the tube to the columella. That would mean that all patients should have a general anæsthetic. He believed that the arms must be tied down during the first twenty-four hours. He left the tubes in for two or three weeks. One could then send the child home and the parent could perform the washout. Dr. Pyman used that method in those cases in which more conservative treatment had failed, and in those in which a course of washouts was needed. He was not very satisfied with his results, but that was probably because that treatment was tried in those cases in which other methods had failed. He asked what reaction the polythene caused in the antrum.

DR. C. CANTOR (Melbourne) asked whether that method was any better than endonasal antrostomy. He said that most antrostomies remained open for a month or two. He thought that antrostomy would provide more prolonged drainage.

DR. A. S. DEB. COCKS (Adelaide) said that he thought that the trochar and cannula made too big a hole. He used a Lichtwitz trochar and cannula and slipped the polythene tube through the cannula. The tube was bent before insertion and anchored to the columella afterwards. The use of that method was rather limited. He used it only for those patients who would not submit to repeated antral lavage. He asked what results had been obtained.

DR. VON DER BORCH (Adelaide) said that he used the method for those children in whom antral lavage produced gross pus. He could not give any statistical results, but thought that they were not very impressive. Lately he had tended to establish an endonasal antrostomy and then to insert the tubes. He left the tubes in for about a week. After that time only mucopus was obtained on lavage, and he thought that was irritative in origin.

Dr. Pearlman said that he regarded that method of treatment as not physiological. Endonasal antrostomy did not prevent the cilia from moving the antral secretions towards the normal ostium. One should use the more physiological method first, and if that failed, then endonasal antrostomy could be performed.

DR. H. EIZENBERG (Sydney) agreed that endonasal antrostomy was not physiological. He had used the method of lavage with metal tubes. He had found that in the majority of cases the condition cleared up in about two weeks, but all patients had returned in a short time with recurrences, and he had then to establish endonasal antrostomies.

DR. R. H. STEVENS (Melbourne) said that he used that method, with bacteriological investigation of the initial washings. That was followed by the administration of an autogenous vaccine, which appeared to improve the results.

DR. P. G. JAY (Adelaide) said that the results were disappointing. One could expect good results in the type of case in which, if the patient was an adult, the condition would clear up with a series of washouts. In cases of sinusitis and bronchiectasis the results were not good, as there seemed to be a constitutional deficiency in the respiratory tract.

DR. A. QUAYLE (Brisbane) said that he believed that method to be most effective and to cause the least interference with the antrum. Unfortunately it did not overcome the constitutional deficiency.

DR. R. A. MATISON (Adelaide) asked what part allergy played in interfering with proper recovery in such cases.

Dr. Rolland, in reply, said that cultures had been prepared from the washings from a few patients. The predominant organisms were *Hæmophilus influenzæ*, *Streptococcus pneumoniæ* and *S. hæmolyticus*. Most were insensitive to penicillin. If an antibiotic was used, it should be either "Chloromycetin" or "Terramycin". The results had been improved by the use of "Chloromycetin" from the start of treatment. Dr. Rolland employed the cuffed tube only in hospitals trained in its use.

Mobilization of Stapes (Deep-Frozen Specimen).

DR. R. H. VON DER BORCH (Adelaide) demonstrated mobilization of stapes (deep-frozen specimen).

Pictorial Demonstration of Reconstructive Nasal Surgery.

DR. FRANK ELLIS (Sydney) presented a demonstration of reconstructive nasal surgery from 100 slides, which formed part of a course entitled "Introduction to Fundamentals of Reconstructive Surgery of the Nasal Septum and the External Nasal Pyramid" given by Dr. Maurice H. Cottle, of Chicago. Dr. Ellis said that the course occupied 100 hours over a period of about eight days, and included lectures, demonstrations, operative demonstrations, seminars and cadaver work. The lectures were copiously illustrated with coloured slides. The 100 slides which he would show were a résumé of a fairly typical rhinoplastic operation; introductory slides illustrated the following points: (i) the effects of birth trauma on the nose; (ii) the proper examination of the base of the nose with the vibrissæ cut and without the distorting effect of the ordinary speculum; (iii) the nasal valves formed by the approximation of the upper lateral cartilages to the nasal septum; the loss of those, as in so-called "ballooning" of the upper laterals, and other

damage caused impaired function of the respiration; (iv) the importance of the proper structure of a nose being related to its proper function.

Dr. Ellis went on to say that in the rhinoplastic procedure the following points were brought out: (i) The septum was the all-important part of the nose, and its reconstruction was of the utmost importance. The older type submucous resection was limited. Cottle's operation was to begin at the caudal end of the septum, from the anterior nasal spine where the deformity usually began, then to follow the whole septum skeleton upward and backward, dealing with all its abnormalities. Deviated and twisted portions were removed, but wherever possible they were replaced. (ii) The bony pyramid was next dealt with, fairly standard exposure being used. The hump was dealt with, in either the usual removal or the so-called "push-down" after the lateral osteotomies had been performed. In Cottle's hands the latter method was a striking operation; it abolished the hump without any removal of bone, and preserved the integrity of the nasal roof. (iii) The "key-stone area" was preserved. That was where the upper lateral cartilages united down with the nasal bones. Dr. Cottle and his group regarded the integrity of that area as essential to a good result. Any separation of the union of the cartilage to bone would show later as an unsightly depression. (iv) The lobule of the nose and its tip were then reconstructed. Cottle's methods followed the usual pattern there, except that he pointed out the importance of reconstituting the nasal valves for proper function. The nasal mucosa was regarded as almost holy ground, was preserved throughout and was delicately handled. (v) The nasal dorsum was finally smoothed and contoured with special nibbling forceps, replacements being made with small flakes of cartilage. (vi) The after-care started with the nasal packs and splinting with adhesive strapping and dental "stent". They were kept in place for a week. The whole operation was based on the physiology and anatomy of the external nasal pyramid and septum. With regard to the cosmetic result, Dr. Cottle stated that "every insect and every human has its right to be beautiful".

DR. A. B. K. WATKINS (Sydney) thanked Dr. Ellis for the demonstration, and said that it appeared that a number of unnecessary instruments were used. He asked what was the significance of the term "nasal valve".

Dr. Ellis, in reply, said that the procedure used was really standard and the instruments were not excessive. He thought that by "nasal valve" Dr. Cottle meant a double-action valve, which was necessitated by the fact that human beings breathed against resistance.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

UNQUALIFIED PRACTITIONERS.[1]

[From the *New South Wales Medical Gazette*, October, 1870.]

IT is not generally known, even amongst the profession, that anyone who chooses to do so may practise medicine in New South Wales. There is no need of either a medical or surgical degree from any British or foreign University and no necessity for pursuing the curriculum of study necessary to enable the practitioner to pass the examination requisite to procure a diploma from a College of Physicians or Surgeons or Society of Apothecaries. The five medical Acts passed by the Legislature of this Colony since 1838 enable gentlemen who possess diplomas to receive fees for giving evidence before a Coroner or Bench of Magistrates but they do nothing more. There is absolutely no law that will prevent a man who is today employed in the useful occupation of a cab driver tomorrow undertaking to remedy "all the ills that flesh is heir to" and assuming whatever titles he pleases. The public have no protection against the wholesale destruction of life and health that may ensue through the profound ignorance of this person. We are sorry that this is the case on account of the injury that has already been inflicted on the people of New South Wales, and we regret the inertia that has prevented the profession from taking such measures as would preclude ignorant persons from assuming the same position which educated medical men have acquired only after years of arduous study and research and much expense. None have greater cause to regret this state of matters than the public themselves.

[1] From the original in the Mitchell Library, Sydney.

Correspondence.

THE EARLY TREATMENT OF SQUINT.

SIR: We would all like to see the disappearance of orthoptists, for that would mean a universal awareness of the urgency of squint, the avoidance of all amblyopia by immediate occlusion, the prescription of exactly correct glasses at once when needed, and the implementation of ideal and perfect surgery at the first opportunity. It would also mean that all parents, nurses and doctors would have been educated to take immediate steps to seek perfect treatment. In the meantime there will remain a need for orthoptists to help us combat the perversions of binocular reflexes that occur with the passage of time. Some of what Kevin O'Day says is quite true. It is agreed that congenital squint and squints of infancy seldom benefit later from orthoptics, because the battle is lost or won much earlier in the story than orthoptics can be applied. Nevertheless, there are numerous children with late-arising squints who can be helped significantly by orthoptics.

Kevin O'Day is, of course, only trailing his provocative coat across an immense and complicated subject when he finds it hard to understand (as he says) why Lyle advocates orthoptics at all. No doubt he is justly irritated by those who try to make the orthoptist do too much for too long and far too late. We all agree that orthoptics can be the refuge of the clinically destitute and that it is in many cases quite useless, but it is not reasonable to reject orthoptic methods for all patients for that reason. Orthoptists can and do deal with the results of neglect in selected cases far better than can be managed without them. Orthoptic methods properly applied are often decisive. By saying that an accommodative squint can be restored to binocular function without orthoptics, Kevin O'Day is being less than frank. A few such cases can be, it is true, but such a happy outcome is the exception. It all comes down in the end to a matter of balance. For twenty years Lyle and others have pointed out that orthoptic methods are useful, sometimes curative, but only a phase in the life history of handling some squints. The real key to good results is early and decisive interference by occlusion, surgery, spectacles or orthoptics at the very first opportunity, according to the needs of the patient.

Yours, etc.,

233 Macquarie Street, Sydney,
June 19, 1957.

JOHN ANTILL POCKLEY.

SOME THOUGHTS ON THE CHEMOTHERAPY OF TUBERCULOSIS.

SIR: I wish to congratulate Dr. P. R. Bull on his excellent summary on the present-day position of tuberculous chemotherapy (M. J. AUSTRALIA, May 25, 1957). In these days of the increasing accent on home treatment of tuberculosis, where patients are often commenced on inadequate chemotherapy without any effort to carry out drug sensitivity studies, it is most pleasing to see attention drawn to both theoretical and practical aspects of the chemotherapy of this disease.

My only point of disagreement with Dr. Bull is concerning the value of pyrazinamide. This drug is being shown, in combination with either streptomycin or INH, to be the greatest potential sterilizer of tuberculous lesions that we have as yet encountered. Unfortunately, it is not freely available, and its toxicity is still suspect.

Dr. Bull referred to the continued sputum-positive, drug-sensitive patient. This is the most occult of all chemotherapy failures and is usually due to inadequate chemotherapy. My experience has been that higher (bactericidal) intermittent doses of streptomycin (which are well tolerated) and also high doses of INH, considerably reduce the likelihood of this state continuing. At the same time, the number of

cases developing drug resistance is also thereby greatly reduced.

Dr. Brian Marks, in the June 15, 1957, issue of THE MEDICAL JOURNAL OF AUSTRALIA, has drawn attention to the claims of Edinburgh workers, who maintain that proper chemotherapy can sterilize practically all, including chronic, tuberculous foci. Led by Professor Crofton, they have obtained really excellent results with long-term chemotherapy; their success is mainly due to a meticulous analysis of each patient prior to treatment and a complete rejection of empirical chemotherapy.

Unfortunately, these good results have not been shared by equally enthusiastic workers in other parts of the world. "Sterile" lesions, as defined by Edinburgh workers, have been shown by other investigators often to contain not "dead" but "dormant" tubercle bacilli, capable of reactivation at any time.

Thus, in this basic endeavour to prevent relapse of any tuberculous focus, resection must be considered in some types of tuberculous disease; this usually well before the end of eighteen months' conservative treatment.

Dr. Marks states that Dr. Bull's therapeutic failures are frequently caused by patients failing to take their treatment. I can well believe this of patients receiving domiciliary or private home care; but that this should occur in nearly 30% of patients who are receiving treatment in a chest hospital seems very hard to believe.

Yours, etc.,

R. MUNRO FORD.

The Morris Hospital,
Northfield,
South Australia.
June 20, 1957.

HEPATITIS.

SIR: We wish to thank Dr. Ward and his colleagues for their generous letter (M. J. AUSTRALIA, June 8, 1957) concerning our papers on chronic hepatitis (*Lancet*, December 29, 1956; M. J. AUSTRALIA, May 18, 1957).

We, too, have been quite impressed by the frequency with which some antecedent circumstance, be it infection or trauma, seems to initiate the process of disseminated *lupus erythematosus* and lupoid hepatitis. We did not, however, imply that lupoid hepatitis is initiated solely by an infection, since one of our patients had established nutritional liver disease. Nor is there good evidence that "lupoid hepatitis" is a manifestation of classical disseminated *lupus erythematosus*, although these two conditions do have features in common.

We have hesitated to use massive steroid therapy in our cases of chronic hepatitis, and we are looking forward to seeing a report of the results Dr. Ward and his colleagues have obtained using doses of cortisone of 800 milligrammes daily in cases of chronic hepatitis during an acute exacerbation.

Yours, etc.,

IAN R. MACKAY,
L. I. TAFT.

Clinical Research Unit,
Royal Melbourne Hospital and Walter and Eliza Hall Institute of Medical Research,
Melbourne.
June 20, 1957.

Obituary.

WILLIAM ERNEST JONES.

ON May 1, 1957, after a long life of distinguished public service, the first Victorian inspector-general of the insane died.

William Ernest Jones, the son of a surgeon, was born in England in 1867. On qualifying in 1890 he was appointed as medical officer to the Middlesex Hospital, London. A year later he spent a term at the Royal Infirmary, Newcastle. Subsequently he was appointed medical officer to the Earlswood Asylum and later to the Leicestershire and Rutland Asylums. On promotion, he was appointed senior medical officer to the Northampton County Asylum, and later became medical superintendent of the new Brecknock and Radnor County Asylum in Wales.

It was about this time that conditions in connexion with lunacy administration in Victoria had got into a parlous state, and it was decided to advertise the newly created post of inspector-general, whose function it would be to bring about very necessary reform within the department. W. E. Jones, being the successful applicant, took up duties in this position in 1905 at the age of thirty-seven years.

During the first World War he gave service to the Australian Army Medical Corps in the rank of lieutenant-colonel, and from 1915 to 1922 he was a member of the council of the Australian Red Cross Society. From 1917 to 1918 he was chairman of the Commission in Lunacy in Western Australia. In 1922 he was president of the Mental Hygiene Council. In 1928 he was president of the Neuro-Psychological Section of the Australasian Medical Congress. In 1929, at the request of the Federal Government, he conducted an investigation and submitted an extensive report on mental deficiency within Australia. For a number of years he was an examiner in neurology and psychiatry for the examination for the degree of doctor of medicine at the University of Melbourne, and was a member of the Faculty of Medicine. In 1937 he was president of the Medico-Legal Society of Victoria. It was during this year that he retired from his position as Inspector-General of the Insane, and later from his position as Director of Mental Hygiene, at the age of seventy years. Eleven years after his retirement he was called upon by the Victorian Government to act as chairman of the committee to investigate and submit recommendations concerning the Mental Hygiene Department of Victoria.

Right up till a fortnight before his death, Jones continued to retain a great interest in departmental happenings and in the progressive measures that were being put in hand. Scarcely a month went by but he would be visiting one or other of the metropolitan institutions with which he had in the past been so closely associated. Throughout his career he had displayed tremendous energy, foresight and enthusiasm. During the first half of the twentieth century he was the acknowledged leader of the reform movement in the care of the mentally ill in Victoria, and made many important contributions to psychiatric literature.

DR. J. CATARINICH writes: My association with W. Ernest Jones goes back to 1907 and continued throughout the years that followed his retirement from the position of Inspector-General of the Insane. When Jones came from England to take charge of the Victorian mental services, he must have been appalled at the immensity of the task which faced him. For many years little or no money had been expended on new buildings, and practically all the mental institutions dated back to the sixties or to a still earlier period. In all of them he found problems concerning sanitation, ventilation, overcrowding, unsuitable housing, the handling of foodstuffs, ill-educated staffs, and hospital accommodation for the sick (unplanned and sometimes improvised and unsuitable). Probably the greatest of his difficulties was his constant endeavour to educate government leaders in the necessity to spend in order to obtain widespread efficiency.

It is not my desire to discuss these difficulties or Jones's struggle to overcome them. From the time of his appointment he set out to liberalize the conditions of detention in mental institutions, and his early endeavours were directed to the provision of a receiving house and the introduction of the voluntary boarder system. There was one sore spot in his department which especially irked him—namely, the existence of the "asylum" at Yarra Bend. It was under Jones's direction that the transfer of the patients from Yarra Bend to Mont Park took place, and he always declared that the epitaph he desired was: "He closed Yarra Bend." To enable this to be done, he envisaged the new institution he was to plan and erect at Mont Park. With some glee he would recount how he had taken the Premier (Bent) on to the high hill overlooking Mont Park and successfully tempted him to buy the property. It was his energy in providing suitable accommodation for patients that caused the late Dr. J. W. Springthorpe, for many years official visitor to the mental institutions, to declare that "Jones is a builder".

It can be truly said that Jones spent his official life in an endeavour to improve the lot of those unfortunates for whom segregation is necessary because of their mental disabilities, and any suggestion to him that might help in this way had his enthusiastic support. His medical staff found him particularly interested in any kind of research, and he was always on the alert for any advance in treatment here or abroad. He foresaw the disappearance of general paralysis of the insane immediately Ehrlich announced the discovery of 606.

From a personal viewpoint Jones was easy of approach, affable, a good *raconteur*, fond of cricket in his younger days, and as an opponent at golf difficult to defeat, being noted for the straightness of his drive down the fairway. His career can equally be summed up in the statement that his aim was always straight and that he never deviated from his course.

DR. J. K. ADEY writes: Dr. W. Ernest Jones, who died on May 1, 1957, was a most efficient administrator of the Department of Mental Hygiene. His chief work was the erection of the Receiving House, Royal Park, and the Mental Hospital, Mont Park, and the consequent abolition of the Lunatic Asylum at Yarra Bend. He was a reformer in the treatment of the insane in Victoria. He speedily abolished strait-jackets and locked gloves, and changed the atmosphere of mental institutions from that of penal establishments for the punishment of nuisances to society, to hospitals for the treatment of the sick.

He improved nursing standards by instituting proper training courses and examinations for attendants and nurses. He instituted the Diploma of Psychological Medicine and gave every encouragement to his medical officers to improve their efficiency. He was always considerate to his medical staff, and had the confidence of all who worked under him.

He was a good "mixer". He was able to persuade politicians that his department deserved consideration. He was a keen golfer and bridge player, was admired by all who met him, and was appreciated for his genial manner, tact and ability.

HUGH WILLIAM FANCOURT MITCHELL.

DR. J. M. ANDREW writes as follows:

Hugh William Fancourt Mitchell, who died at Bairnsdale on January 7, 1957, toward the close of his sixty-ninth year, was born at Kyneton, Victoria, on January 15, 1888. In the year 1842, his grandfather, William Henry Fancourt Mitchell, relinquished his post as Secretary to Sir John Franklin, the Governor of Tasmania, and came to Victoria to settle on the land at Barfold, in the Kyneton district, a property which he held until his death in 1884. He had previously married a daughter of Janet Templeton, a lady who was responsible for the introduction of the pure Saxony merino sheep to Tasmania, and later to Victoria. In 1851 he was invited by the Governor of Victoria, Charles LaTrobe, to come to Melbourne to form the first Victorian Police Force, a request which was made in person by the Governor, who had ridden expressly from Melbourne to Barfold to do so. Thus he became Victoria's first Commissioner of Police, a post which he held till 1855. In addition he was a member of the Legislative Council from 1853 until his death, as well as serving in several ministerial capacities and as President of the Council from 1870, for which many and varied public services he received the honour of Knight Bachelor. Of three sons, two survived, in addition to several daughters. One son, Henry St. John Mitchell, a graduate in medicine of the University of Melbourne, married Lena Nankivell, and was the father of Hugh Mitchell. The other, Edward Fancourt Mitchell, studied law, became a celebrated barrister, leader of the Bar, and Member of the Legislative Council, and was created a Knight Commander of the Most Distinguished Order of St. Michael and St. George.

Hugh Mitchell's early years were spent in Toorak Village, and later in Swan Hill, where his father was in practice, and in 1900 he went to school at Scotch College, Melbourne. For four years he was the cox of the "Scotch" crew, as well as of the champion Mercantile "fours" in 1901. After his matriculation he studied medicine, graduating in 1911, and proceeded to Western Australia, where, after a year as resident medical officer at the Perth General Hospital, he commenced practice at Brookton, continuing till his enlistment for overseas service with the Australian Imperial Force in August, 1915. As a captain in the 13th Field Ambulance he saw service in Egypt, Gallipoli and France, where he was awarded the Military Cross in 1916. Of this period, Sir Victor Hurley has written the following account to me:

> The death of Dr. Hugh ("Pup") Mitchell will be deeply deplored by those who served with him in the A.I.F. in the First World War.
>
> As a Regimental Medical Officer he was involved in much of the heavy fighting in which Australian troops were engaged on the Western Front in 1916 and 1917. In the strenuous conditions which obtained—particularly in the severe 1916 winter on the Somme—a great deal depended upon the Medical Officers of Field Units to maintain the health, physical fitness, and morale, of the troops. Mitchell had all the qualities for such and all responsibilities. He fully shared the hardships and hazards of his men, and always had their confidence and trust. For conspicuous bravery and devotion to duty he was awarded the Military Cross.

Later in the war he was transferred to the 2nd A.G.H. at Wimereux near Boulogne, and especially qualified himself in anæsthetic and resuscitation work—including blood transfusions which had recently been introduced. He was, therefore, selected as anæsthetist to a surgical team, with myself as surgeon, which was attached for several months in 1918 to a Casualty Clearing Station in the 3rd British Army near Doullens.

At the same unit was E. T. C. Milligan—a Melbourne graduate who had joined up in England with the R.A.M.C., and who was so well known after the war to many Australian medical officers for his work at St. Mark's Hospital, London.

Whilst abroad, Hugh Mitchell married Florence Agnes Manning, an Australian nursing sister, the marriage taking place at St. Paul's Church in Millhill Parish, Co. Middlesex, on April 24, 1917. He was promoted to the rank of major in August of the same year. Returning to Australia in June, 1919, he was finally discharged from the services in October of that year, and after disposing of his medical interests in Western Australia, he commenced general practice in Morwell, Victoria, succeeding the late E. W. Sutcliffe. Here his real life work began and continued for almost thirty years, until he retired from active practice to reside in Bairnsdale in the year 1948.

The personality of Hugh Mitchell may be summed up in the words of Dr. Jeffreys Wood, written in a testimonial given him in 1912; among other things, Dr. Wood stated: "I have formed a very high opinion of Mr. Mitchell's medical and surgical knowledge and consider that he would have taken a high place on the honours list if he had entered for honours. He was one of the steadiest and hardest working students of his year, and his cheery way of doing his work

made him a great favourite with all he came in contact." This innate modesty he carried with him throughout his life. He was much more interested in practical things than in theoretical pursuits, and of a dexterous hand and keen eye. Whether in the conduct of his practice or in the many outside interests which he had, there was always the same keenness and the emphasis on personal relationships rather than results in themselves.

The thoroughness of his clinical work soon earned him a wide reputation throughout central Gippsland, and it was not long before his opinion was sought by his colleagues and patients alike in a consultative capacity. The present writer well remembers with gratitude just what such assistance meant to one on the threshold of general practice. This aspect of his work was recognized in 1940 by his admission to Membership of The Royal Australasian College of Physicians. His greatest monument, however, lies in the hearts of his patients, for if ever a man was beloved by his patients, it was Hugh Mitchell. One has only to get into conversation with the older generation of residents of the district to realize something of the depth of the affection and respect in which he was held.

In retrospect, it seems unbelievable that he found the time to devote to his many and varied outside interests in addition to the practice of his profession. He was a keen supporter of Legacy, and was secretary of the Morwell Branch for some years, and at the time of his death was secretary of the Bairnsdale Branch; he was always a strong member of the Returned Sailors, Soldiers and Airmen's Imperial League of Australia. For years a keen tennis player and cricketer, he was also interested in field activities, golf, the gun, and the rod and line. For years he was associated with the Gippsland Angling Club and was its representative on the Victorian Piscatorial Council, upon which he held office as vice-president. He was proud of his collection of guns, being a first-class field shot, and was a member of the winning team in the Commonwealth Teams Championship for pigeon shooters in 1930. In 1922 he joined the Masonic Lodge, but of later years he was forced by the pressure of work and his other interests to forgo this interest. He was a foundation member of the Morwell Branch of Rotary, and in addition was a member of the Melbourne Cricket Club, the Commercial Travellers' Association and the Royal Melbourne Golf Club. In his latter years his health made it necessary for him to forgo the more active of his earlier pursuits, and he became interested in bowls, with all the keenness of a youngster, for he remained to the end young in heart. His wife predeceased him in 1949. Two sons and two daughters survive him—Dr. Donald F. Mitchell, of Morwell, Kathleen (Mrs. R. Pearse, Burra, South Australia), Benet, and Hugh J. (Melbourne).

GRACE CLARA STONE.

DR. ELIZABETH CLUCAS sends the following appreciation of Dr. Grace Clara Stone.

Dr. Grace Clara Stone died at her home in East St. Kilda at the age of ninety-seven years on May 10, 1957. Dr. Clara Stone and Dr. Margaret Whyte were the first two medical women to graduate at the University of Melbourne. Dr. Stone also was one of the ten medical women who met together in 1896 when plans were made to start a hospital for women. Dr. Clara Stone's elder sister, Dr. Constance Stone, tried for some years to gain admission to study at the University of Melbourne, but was refused. She then decided to go to the United States of America to study at the Women's Medical College of Philadelphia, where she gained her degree. Then, to obtain a British degree, she attended the university of Trinity College, Toronto, and obtained the further degree there. Some time after Constance went to the United States, a group of medical women students were allowed to enter at the University of Melbourne after much opposition. Among this group was Dr. Clara Stone. All through their student days the women planned what they would do in the future, and always this was their conclusion: "One day we will have a hospital of our own."

When Constance returned to Melbourne in 1889, some of the students were approaching graduation, and as soon as Clara graduated, she joined Constance at Dr. Singleton's free dispensary. In 1893 Constance married Dr. Egryn Jones. On September 5, 1896, Constance invited ten women doctors of Melbourne to her home to plan their first united enterprise—among those present was Clara Stone. At that meeting Dr. Egryn Jones offered, in the name of the deacons of his church, the use of the hall behind the church for hospital purposes. Dr. Clara had been given £2 by a private patient from Queensland to be used for the benefit of women. She handed that donation in at that meeting as a contribution to the funds. The hall soon became too small, and an in-patient department was found to be necessary. At the late Queen Victoria's Jubilee, a shilling fund was started, and the Queen Victoria Hospital came into being in Mint Place.

Dr. Clara Stone travelled for almost two years before she retired, and would talk of her travels in such an interesting way that the places she had visited almost became real to the listener. She was a most interesting personality, was a great reader, and had a keen sense of humour. Many people in many walks of life and in all age groups feel that the world is a poorer place without her presence; but we are all thankful for her influence and for the marvellous work she has done.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course in Obstetrics and Gynæcology.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a course in obstetrics and gynæcology by the staff of The Women's Hospital, Crown Street, Sydney, will be held from Monday to Friday, September 2 to 6, 1957, under the supervision of Dr. J. G. Harrington. Enrolments will be limited to 14 post-graduate students in residence, and 12 attending as external students. Professor R. J. Kellar, M.B.E., F.R.C.S., F.R.C.O.G., Professor of Obstetrics and Gynæcology in the University of Edinburgh, will be guest speaker. The fees for attendance are £8 18s. 6d. (including board and residence), or £6 6s. (external attendance). Candidates may take up residence on Saturday afternoon, August 31, after 4 p.m. The programme is as follows:

Monday, September 2: 9 to 10 a.m., welcome and tour of the hospital; 10.30 a.m. to 1 p.m., "Obstetric Emergencies in General Practice", Dr. F. A. Bellingham; 2 to 3.30 p.m., "Modern Treatment of Placenta Prævia", Dr. S. Devenish Meares; 4 to 5 p.m., "Prevention of Prematurity by the Obstetrician", Dr. R. Macbeth.

Tuesday, September 3: 9 to 10 a.m., "Induction of Labour: Indications", Dr. J. N. Chesterman (chairman, Professor R. J. Kellar); 10.30 a.m. to 1 p.m., obstetric ward rounds, Professor R. J. Kellar; 2 to 3.30 p.m., sterility clinic, Dr. Alan Grant and Dr. R. Mackey; 4 to 5 p.m., "Breech Presentation", Dr. R. Mackey.

Wednesday, September 4: 9 to 10 a.m., demonstration, "Cæsarean Section", Dr. J. N. Chesterman; 10.30 a.m. to 1 p.m., cancer clinic, Dr. J. N. Chesterman and Dr. R. B. C. Stevenson; 2 to 3.30 p.m., "Conservative Gynæcological Surgery", Dr. R. B. C. Stevenson; 4 to 5 p.m., pathology demonstration; 8.15 p.m., Stawell Hall, 145 Macquarie Street, lecture, "The Endocrine Control of the Menstrual Cycle in Health and Disease", Professor R. J. Kellar.

Thursday, September 5: 9 to 10 a.m., "Practical Use of Hormones in Gynæcology", Dr. Alan Grant; 10.30 a.m., "Medical Pædiatrics", Dr. S. E. L. Stening; 12 noon to 1 p.m., "Trial Labour", Dr. D. McGrath; 2 to 3.30 p.m., "Clinical Problems Encountered in Toxæmia", Dr. R. B. C. Stevenson; 4 to 5 p.m., "Complications During and After Cæsarean Section", Dr. K. A. McGarrity.

Friday, September 6: 9 to 10 a.m., out-patient gynæcological demonstration, Dr. Malcolm Drummond; 10.30 a.m. to 1 p.m., obstetric ward rounds, Professor R. J. Kellar; 2 to 3.30 p.m., quiz on questions submitted—the staff: 4 to 5 p.m., cocktails and conversazione.

Method of Enrolment.

Written application, enclosing remittance for attendance as a resident or external student, should be made at an early date to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Enrolments will be made in order of receipt of fees, and the list will be closed as soon as the required number of applications is received. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

Week-End Course in Rheumatic Diseases.

The Post-Graduate Committee in Medicine in the University of Sydney announces that a week-end course in rheumatic diseases will be conducted at the Royal Prince Alfred Hospital from 10.15 a.m. to 5.15 p.m. on Saturday, October 12, and from 9.15 a.m. to 12.30 p.m. on Sunday, October 13, 1957. The fee for attendance will be £3 3s., and the course will be of interest to general practitioners.

Further particulars may be obtained on application to the Course Secretary, The Post-Graduate Committee in Medicine in the University of Sydney, 131 Macquarie Street, Sydney. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

PROGRAMME FOR AUGUST, 1957.

Refresher Courses.

Gynæcology and Obstetrics.—A refresher course in gynæcology and obstetrics will be held at the Royal Women's Hospital on August 5 to 16. This is a full-time course, from 9 a.m. till late afternoon daily, Monday to Friday. It consists of lectures, demonstrations and ward rounds by members of the hospital staff. Professor Robert Kellar will also take part. Residential accommodation is available at the hospital. The fee for the course is £14 14s., board and lodging £8 8s.

General Medicine and Surgery.—A course in general medicine and surgery will be held on August 19 to 23. This course will consist of lectures and demonstrations at the following hospitals: Monday, the Royal Melbourne Hospital; Tuesday, Saint Vincent's Hospital; Wednesday morning, Fairfield Infectious Diseases Hospital; Wednesday afternoon, the Royal Children's Hospital; Thursday, Prince Henry's Hospital; Friday, the Alfred Hospital. Arrangements will be made for lunch each day. The fee for the course is £9 9s.

Overseas Lecturers.

Professor Robert Kellar.—The programme of Professor Robert Kellar, M.B.E., F.R.C.S., F.R.C.P., F.R.C.O.G., Professor of Obstetrics and Gynæcology, University of Edinburgh, will be as follows: Tuesday, July 30: 8.15 p.m., lecture at the Royal College of Obstetricians and Gynæcologists' Hall, 8 LaTrobe Street, C.1, on "Pregnancy Toxæmia". Wednesday, July 31: Morning, visit to Royal Melbourne Hospital. Thursday, August 1: Morning, visit to Royal Women's Hospital—10.30 a.m., gynæcological session; 8.15 p.m., lecture at 8 LaTrobe Street on "Carcinoma of the Cervix". Monday, August 5: Morning, visit to Queen Victoria Hospital; afternoon, visit to Saint Vincent's Hospital. Tuesday, August 6: Morning, visit to Royal Women's Hospital—9 a.m., pathology department; 10.30 a.m., obstetrical session; 8.15 p.m., lecture at 8 LaTrobe Street on "Ante-Partum Hæmorrhage". Wednesday, August 7: Visit to Royal Women's Hospital—2 p.m., Dr. Dickinson, "Prolapse of the Cord"; Dr. Lyons, "Vaginal Hysterectomy"; 3.30 p.m., case presentations by two medical students. Thursday, August 8: Morning, visit to Alfred Hospital; 8.15 p.m., lecture at Medical Society Hall on "The Endocrine Control of the Menstrual Cycle in Health and Disease".

Professor Robert Cruickshank.—Professor Robert Cruickshank, M.D., F.R.C.P., Principal of the Wright-Fleming Institute of Microbiology, St. Mary's Hospital, London, will visit Melbourne from August 12 to 16. He will visit the University of Melbourne and various departments, and will give a lecture on Thursday, August 15, at 8.15 p.m., at the Medical Society Hall, on "The Rational Use of Antimicrobial Drugs".

Mr. A. Dickson Wright.—Mr. A. Dickson Wright, M.S., F.R.C.S., of St. Mary's Hospital, London, will lecture at 8.30 p.m. on Wednesday, August 21, at the Royal Australasian College of Surgeons, on "Varicose Veins and Ulcers". The College has invited the medical profession to this lecture.

Lecture in September.—On Thursday, September 5, Dr. Daniel Morton, Professor of Obstetrics and Gynæcology, U.C.L.A. Medical Centre, Los Angeles, will lecture at 8 LaTrobe Street on "Hormone Therapy".

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JUNE 22, 1957.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	..	6(5)	1	..	1(1)	..	..	..	8
Amœbiasis	..	..	1	..	..	..	..	..	1
Ancylostomiasis	..	..	3	..	..	..	..	..	3
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	1	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	1	..	..	..	1
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	7(6)	16(14)	3(1)	..	3(3)	..	..	..	29
Diphtheria	2(2)	4(3)	2(1)	..	..	..	..	..	8
Dysentery (Bacillary)	..	..	..	3(3)	1	..	..	..	4
Encephalitis	..	2(2)	..	..	..	..	..	..	2
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	41(15)	26(12)	..	4(4)	2(2)	3	1	..	77
Lead Poisoning	..	..	..	..	4	..	..	..	4
Leprosy	..	1(1)	..	..	..	..	..	..	1
Leptospirosis	..	..	5	..	..	..	..	..	5
Malaria	..	..	4(1)	..	..	5	..	..	9
Meningococcal Infection	1(1)	1(1)	..	..	..	3	..	..	5
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	1(1)	..	..	..	1
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	1	2(2)	..	1(1)	..	..	..	..	4
Puerperal Fever	..	1	..	..	..	..	..	..	1
Rubella	..	33(21)	..	3(1)	13(3)	..	2	..	51
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	6(3)	19(14)	6(4)	3(3)	6(2)	..	..	..	46
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	2(1)	..	..	..	..	..	2
Trachoma	..	..	..	..	6(5)	..	..	..	6
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	26(15)	11(7)	6(5)	4(3)	6(1)	4(1)	..	1	58
Typhoid Fever	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Country Courses.

Bendigo.—On August 2, at 8 p.m., at the Bendigo Base Hospital, Mr. T. Ackland will lecture on "Lumps in the Breast". Dr. A. J. Walters, 514 High Street, Golden Square, Bendigo, is the local secretary.

Ballarat.—On August 22, at 8.15 p.m., at Craig's Hotel, Ballarat, Dr. M. L. Powell will lecture on "Recent Advances in Pædiatrics". Dr. N. Pescott, 626 Sturt Street, Ballarat, is the local secretary.

Horsham.—The date of the Horsham course has been altered from October 12 to November 9.

INFORMATION.

The address of the Melbourne Medical Post-Graduate Committee is 394 Albert Street, East Melbourne, C.2. Telephone: FB 2547.

THE AUSTRALIAN POST-GRADUATE FEDERATION IN MEDICINE.

Visit of Professor R. J. Kellar.

THE Professor of Obstetrics and Gynæcology in the University of Edinburgh, Professor R. J. Kellar, will visit Australia, as a guest of the Federation, for a period of eight weeks from July 13, 1957. He will visit, in turn, each of the States of Australia, commencing in Western Australia and then travelling to South Australia, Victoria, Tasmania, Queensland and New South Wales. Professor Kellar served in the British Army in North Africa during the second World War, and at that time became known to many medical officers of the Australian Army.

Notice.

VICTORIAN BRANCH (BRITISH MEDICAL ASSOCIATION).

Section of Preventive Medicine.

A MEETING of the Section of Preventive Medicine of the Victorian Branch of the British Medical Association will be held at the Medical Society Hall, 426 Albert Street, Melbourne, on Thursday, July 25, at 4.30 p.m. Sir Peter MacCallum will read a paper on "Medical Experiences in China".

Medical Prizes.

AUSTRALIAN SOCIETY OF ANÆSTHETISTS' PRIZE FOR ANÆSTHETIC REGISTRARS.

THE Australian Society of Anæsthetists offers an annual prize of £25 for the best original paper submitted by an Australian anæsthetic registrar.

Award for 1956.

The award of the prize for 1956 was made to Dr. Judith N. Nicholas, of Sydney.

Conditions of Entry for 1957.

The conditions of entry for the 1957 prize are as follows:

1. The Australian Society of Anæsthetists awards an annual prize of £25 for the best original paper submitted by an Australian anæsthetist holding the grading of senior registrar or under. It is not necessary that he or she be a member of the Society.

2. The subject of the paper is optional, but must be related to anæsthesia. It is desirable that papers submitted show evidence of personal work, but papers consisting of surveys of the literature are eligible for consideration. The paper must not have been previously read at any meeting or published in any journal.

3. The winner of the prize will be invited to read his paper at the annual general meeting of the Australian Society of Anæsthetists. The Society will give every assistance in obtaining publication of the paper in a recognized medical journal.

4. Papers for adjudication should reach the Honorary Secretary, Dr. Patricia Wilson, c.o. Royal Melbourne Hospital, Melbourne, not later than December 1, 1957.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Tuza, Francis Louis Charles, registered under Section 17 (2) (*b*), Territories, of the *Medical Practitioners Act*, 1938-1957, 9 Reserve Street, Seaforth, New South Wales.

The undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Thillainath, Arumugam, M.B., B.S., 1955 (Univ. Melbourne), 18 Magill Road, Norwood, South Australia.

Weston, Frank Keith, M.B., B.S., 1956 (Univ. Adelaide), 10 Ruthven Mansions, Pulteney Street, Adelaide.

Deaths.

THE following death has been announced:

FLECKER.—Hugo Flecker, on June 24, 1957, at Cairns, Queensland.

Diary for the Month.

JULY 15.—Victorian Branch, B.M.A.: Finance Subcommittee.
JULY 16.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JULY 17.—Western Australian Branch, B.M.A.: General Meeting.
JULY 18.—Victorian Branch, B.M.A.: Executive of Branch Council.
JULY 18.—New South Wales Branch, B.M.A.: Clinical Meeting.
JULY 23.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Queensland Branch (Honorary Secretary, B.M.A. House, 88 L'Estrange Terrace, Kelvin Grove, Brisbane): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

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MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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